

STATEWIDE FOREST PLAN

DEVELOPING OPTIONS

2001



Form 2400-132

Inside front cover

Introduction

As the next step toward developing a statewide forest plan, the Department of Natural Resources would appreciate your input on the following options associated with fifty-five forestry trends and issues. During the process to solicit feedback on the draft trends and issues, we were told by the public to include all 45 trends and issues in the plan. In addition, we were asked by you and others who commented to include even more issues. We consolidated the recommendations into 10 additional issues, bringing the total to 55.

The desire to include all relevant issues in the plan is commendable. However, it also creates a challenge for all of us involved in the planning process. We have been hard pressed to describe concisely the large number of complex and often controversial issues. Even having done so, the amount of material being sent to you for review is large.

We have endeavored to facilitate your review by constraining the amount of information provided for each issue and by providing a survey format for your responses. Please feel free to comment on as many or few of the issues as you care to. Your input is important to us, whether it is on one issue or 55.

The purpose of this stage in our process is to gather public feedback on the broad options associated with the trends and issues facing Wisconsin's forests.

Instructions

Please indicate in the spaces provided whether you oppose or favor the options associated with each trend/issue. We also welcome your feedback on the issue descriptions and implications, and whether one or more additional options should also be considered during the process. This is indeed a work in progress!

Once you have completed your responses, send it back to us (we pay the postage) by August 27th, 2001. We will be using the feedback you and others provide to help prepare the draft plan. We will be coming back this Fall to ask you for feedback on the draft plan.

Thank-you in advance for helping us develop a comprehensive statewide forest plan that will shape the future of Wisconsin's magnificent forest resources.

Notice: Completion of this survey is voluntary. The information collected will be used as the Department develops a statewide forest plan. Personal identifiers will be used to share results of this poll with you and provide you with additional information about the plan. Information must also be made available to requesters as required by Wisconsin Open Records law [s. 19.31–19.39, Wis. Stats.].

Additional Information

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A1. Trend: Wisconsin's forests are aging and forest succession is occurring.

Trend Definition

Wisconsin's forests are aging. Most of the state's forestland is a result of regeneration or planting in the early to mid-1900s. Mid-to late-succession maple-basswood forests are replacing the early succession aspen-birch and oak forests of the '40s–'70s. The forest inventory of 1983 was the first Wisconsin inventory to show more maple-basswood acres than aspen-birch. Aging forests—and the associated species composition, structure and function changes—impact economic and recreational opportunities, as well as biodiversity.

Implications

Ecological: A new kind of forest continues to develop. In general, late successional species and cover types are becoming more abundant and early successional ones less abundant. If these successional trends continue, forest types that could increase in abundance on dry sites are soft maple, oak-hickory, and white pine; on mesic sites predominantly maple-basswood; and on wetter sites elm-ash-soft maple, fir-spruce, and black spruce. Forest types that could become less abundant include jack pine, natural red pine, aspen, white birch, and on mesic sites, oak-hickory. On the mesic sites, sugar maple could significantly dominate, and thereby reduce the abundance of many other species for a generation or more. Although forests, on the average, are aging, different cover types show different trends. For example, the aspen cover type is actually younger due to the large acreage that recently matured and was harvested and regenerated, whereas the maple-basswood cover type is aging due to longer species lifespans and applied management regimes. As forests age, trees become older and larger, but the development of other structural characteristics, such as increased coarse woody debris and large snags, will depend on management techniques applied. Forest aging and succession are not interdependent; forests may age without advancing successional or may advance successional while actually becoming younger. Management will determine the successional path of an aging forest. In terms of wildlife and biodiversity, species abundance can be expected to change, with some species (associated with older and/or late successional forests) becoming more abundant, and some species (associated with younger and/or early successional forests) potentially decreasing in abundance (other landscape factors will significantly impact relative abundances).

Economic: For most species, forest growth continues to exceed removals, and tree size is increasing. As a result, timber volume, particularly sawtimber volume, is increasing. However, larger trees and a different mix of species could require a shift in technologies (harvesting and processing) and products. Generally, larger, older forests are considered more aesthetically pleasing, which could result in an increase of, or increased satisfaction with, certain nature based tourism activities. However, if certain common wildlife species become less abundant, watching and hunting of these species could decrease.

Social: As the forests continue to develop, social benefits associated with forest products and recreation generally can improve. There will be more opportunities for uneven-aged selection management, as later successional species become more common. Conflict probably will continue to swirl around the relative supply of different benefits, and the values assigned to the forest.

Comment—Developing Options

A1. Trend: **Wisconsin's forests are aging and forest succession is occurring.**

Please check one:

- ☐ I am interested in this trend/issue and wish to provide comments (*Please go to options below.*)
- ☐ I am NOT interested in this trend/issue and do not wish to respond (*Please go to next page.*)
- ☐ I am interested in this trend/issue BUT I can not comment because (*Please check one.*)
- ☐ Too complex ☐ I need more information ☐ Other _____

Options

Please circle one response for each option.

- A. The current trend, resulting in older, later successional forests.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- B. Promote continuation of a landscape mix of forests that represent a full array of age classes and successional stages.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- C. Promote maintaining a larger proportion of the landscape in younger, early successional forests

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

Suggest changes to existing option(s) or recommend another option(s) and/or general comments about the trend/issue, implications and/or options.

A2. Trend: Forestland is increasing.

Trend Definition

Between 1983 and 1996, Wisconsin's forestland increased by 640,000 acres. This trend of increasing forestland began in the 1960s and is mostly the result of marginal agricultural land converting back to forests.

Implications

Ecological: An ecological benefit of the increase in forestland is the additional habitat it provides for forest dwelling species. Different species utilize openlands, and may be negatively affected by the conversion to forest. The relative abundance and distribution of forest and openland, in any combination will benefit some species and impact others. Openland habitat may be more appropriate in some parts of the state, and forest in other parts, depending on habitat scarcity, species needs, and suitability of the land area in question. Carbon sequestration is another benefit of the increase in forestland; reforestation is thought to be a way to mitigate global warming associated with CO₂ buildup in the atmosphere.

Economic: The increase in forested acreage between 1983 and 1996 represents 4% of currently forested lands. This rate of increase has been about the same since the 1960's. If the trend continues, increases in forested land could have a slight positive economic impact on forest-dependent sectors (timber production and tourism) when the new forests reach maturity.

Social: Social effects of the increase in forestland are difficult to quantify. Forests are desirable to many people, and are one factor that draws people to the North Woods for recreation, second home development, or new primary homes. The additional forests may eventually contribute slightly to quality of life. However, early in the process of succession, old fields may detract from scenic quality and have a slight negative impact on development.

Comment—Developing Options

A2. Trend: **Forestland is increasing.**

Please check one:

- ☐ I am interested in this trend/issue and wish to provide comments (*Please go to options below.*)
- ☐ I am NOT interested in this trend/issue and do not wish to respond (*Please go to next page.*)
- ☐ I am interested in this trend/issue BUT I can not comment because (*Please check one.*)
- ☐ Too complex ☐ I need more information ☐ Other _____

Options

Please circle one response for each option.

- A. Encourage additional increases in forestland.

1
Favor

2
**Neither favor
nor oppose**

3
Oppose

4
**I don't understand,
need more information**

- B. Encourage reductions in forestland to favor openlands for their values as wildlife habitat or native plant communities.

1
Favor

2
**Neither favor
nor oppose**

3
Oppose

4
**I don't understand,
need more information**

- C. Identify areas where openlands are being converted to forest and vice versa, and collaboratively develop plans that include both forests and openlands in locations that provide the greatest benefit.

1
Favor

2
**Neither favor
nor oppose**

3
Oppose

4
**I don't understand,
need more information**

Suggest changes to existing option(s) or recommend another option(s) and/or general comments about the trend/issue, implications and/or options.

A3. Issue: Some species are declining.

Issue Definition

Some tree species have declined or effectively been removed from Wisconsin's forests. American elm and butternut have declined in recent years. Dutch elm disease and butternut canker have seriously impacted these beautiful and valuable tree species. Some individual trees show resistance to the various diseases, but not enough to hope for recovery in the near future. Jack pine and the jack pine forest type acreage are also decreasing. Much of the acreage is being replaced with other pine or oak species. The oak in particular reflects a later successional type due to a management choice or lack of disturbance, primarily fire.

Implications

Ecological: American elm, formerly a major component of bottomland forests, is reduced or eliminated. It has been replaced by silver maple and black ash. The wetland forest biodiversity has been reduced.

Butternut, a valuable nut species and formerly a minor component of northern and southern Wisconsin mesic forests, is now missing from most stands. Over 90% of the residual butternuts are infected with the butternut canker. Regeneration is occurring but limited. Over 50% of seedlings are infected.

Jack pine is a colonizing species in dry sandy soils and a major component of pine barrens are greatly reduced in area and volume in the sandy areas of the central counties and the northwest.

Economic: The supplies of elm and jack pine, both valuable (for lumber and pulp) species, are limited. Butternut, a valuable species for woodcarving and specialty-products is seldom available.

Social: American elm was one of the most popular shade trees in the United States. It was an ideal shade tree in its ability to provide heavy shade and ability to endure the many stresses in the urban environment. Norway maple and green ash have commonly been used in the urban landscape as replacements for American Elm.

Comment—Developing Options

A3. Issue: **Some species are declining**

Please check one:

- ☐ I am interested in this trend/issue and wish to provide comments (*Please go to options below.*)
- ☐ I am NOT interested in this trend/issue and do not wish to respond (*Please go to next page.*)
- ☐ I am interested in this trend/issue BUT I can not comment because (*Please check one.*)
- ☐ Too complex ☐ I need more information ☐ Other _____

Options

Please circle one response for each option.

- A. Take no overt action. Very likely in time, elms can be expected to become resistant to Dutch Elm Disease and will persist as a component of the forests. Jack pine acreage will likely decrease and the presence of butternut will also diminish.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- B. Encourage the maintenance of species that are becoming uncommon, such as American elm and butternut, as a component in forest stands. Encourage the distribution of age classes within the jack pine forest cover type.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- C. Aggressively invest in the development of technology, such as developing resistant strains of elm and butternut, and work to maintain and if necessary, re-introduce these species where possible. Aggressively plan the maintenance of jack pine as a prominent forest cover type on appropriate sites within Wisconsin.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

Suggest changes to existing option(s) or recommend another option(s) and/or general comments about the trend/issue, implications and/or options.

A4. Trend: **There is limited oak regeneration in southern Wisconsin.**

Trend Definition

On a statewide basis, oak-hickory acreage increased slightly between 1983 and 1996 (primarily on dry, sandy sites); however, acreage decreased in southern Wisconsin. This trend most likely is a result of the aging and the continued heavy selection harvests of oak-hickory forests concentrated in southwestern Wisconsin, which increase the rate of succession to elm-ash-soft maple and maple-basswood types. This, in conjunction with the difficulty in regenerating the mid-tolerant northern red oak on good sites in southwestern Wisconsin, and the resulting large decrease in seedling-sapling acreage, provides support for a continued decline in oak-hickory acres and the red oak species in southern Wisconsin.

Implications

Ecological: In southern Wisconsin, a landscape extensively impacted by fire and characterized by a mix of prairies, savannas, oak forests, and some mesic hardwood forests has shifted to one that lacks fire and is characterized by development, agriculture, oak forests, and some mesic hardwood forests. These oak forests are now converting, through natural succession and partial harvesting of the oaks, to mixed mid-tolerant and mesic tolerant hardwood forests where oak is being reduced to the role of another mid-tolerant associate. In many cases oak forests are converting to a mid-tolerant mix of oak, black cherry, elms, hickories, red maple, and sometimes a dense shrub layer. If seed sources are available, these are moving towards sugar maple, basswood, and ash. However, as long-lived and abundant as the oaks are, they will continue to be a part of this landscape for a long time. Structural and functional characteristics have already changed dramatically (and almost completely) following European-American settlement. Further changes can be expected as these forests mature and succession proceeds. These changes in the forest will influence biodiversity and wildlife richness and abundance, with species specific changes responding to the abundance of preferred habitat and food. However, in this landscape, landuse, fragmentation, and the availability of other habitats are more important determinants of species richness and abundance.

Economic: Oak has higher value lumber than many of the species replacing it. As oak representation diminishes, relative stand timber value can be expected to decrease somewhat. Inefficient sawmills, and the jobs they provide in the region, may go out of business faster with the necessary conversion to other, lower value species. Over the longer term, on mesic sites, uneven-aged management of tolerant hardwoods can provide a viable and competitive alternative. The shift away from oak is not expected to have significant impacts on tourism. Potential hunting opportunities could decrease due to a decrease in mast production, but many other food sources are available in this fragmented landscape.

Social: Conversion of oak forests to more tolerant types will enable less aggressive and visually dramatic harvest and regeneration techniques. Oak is a popular species; its decreasing abundance may cause concern for oak enthusiasts.

Comment—Developing Options

A4. Trend: **There is limited oak regeneration in southern Wisconsin.**

Please check one:

- ☐ I am interested in this trend/issue and wish to provide comments (*Please go to options below.*)
- ☐ I am NOT interested in this trend/issue and do not wish to respond (*Please go to next page.*)
- ☐ I am interested in this trend/issue BUT I can not comment because (*Please check one.*)
- ☐ Too complex ☐ I need more information ☐ Other _____

Options

Please circle one response for each option.

- A. Permit the current trend to continue, allowing the conversion of oak forests to species such as black cherry, elms, hickories, red maple, or shrubs.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- B. Maintain oak dominance to the greatest extent possible through aggressive management techniques.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- C. Encourage the development and maintenance of a landscape mix of prairies, savannas, and oak forests in southern Wisconsin, collaboratively identifying the location and amount of each community type.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

Suggest changes to existing option(s) or recommend another option(s) and/or general comments about the trend/issue, implications and/or options.

A5. Issue: Information about biodiversity is scarce.

Issue Definition

We are still exploring and learning about biodiversity and what it means to human beings and to the forest. There are clearly holes in our knowledge. For example:

- We do not have a good understanding of the diversity of Wisconsin's non-vascular plants, invertebrates, or herptiles.
- Genetic diversity within species is something we're just beginning to examine.
- The relationship of forest composition and structure to ecosystem function—a critical piece of the puzzle—is not well understood beyond some basic knowledge of nutrient and energy cycles.
- An understanding of the different scales at which biodiversity is important is also just emerging.
- The positive and negative impacts of forest succession on species diversity are not well known.
- The role of reserves, buffers, and corridors need further study to clarify their relationships with conserving biodiversity.
- Coarse woody debris is a stand attribute that can be managed for; however, guidelines need to be developed for various forest types and sites.
- Monitoring of management activities and development of feedback mechanisms need to be refined in order to understand forest changes and subsequent adaptive management alternatives.

Implications

Ecological: Wisconsin's biological diversity is a very complex issue. It involves thousands of species, their habitats, and their interactions with each other and the environment, including humans. Assessments of biological diversity have been conducted at global, national, and state-wide scales, and hundreds of books have been written. Still, we lack detailed information, particularly about less-common species and their ecological relationships at a scale suitable for evaluating management alternatives.

There are many ways of measuring biological diversity, and conclusions about ecological implications depend on the measurement and the spatial or temporal scale. Biological diversity (as measured by the number of different species present) can be increased at a local scale by adding generalist species, but this can negatively impact other species and reduce overall biodiversity in the region. Not all species are equally important in planning for biological diversity. At issue is which species are present, rather than how many.

Biological diversity at a broad scale, such as a continent, is considered beneficial because a large variety of species provide materials, food, and medicines that people use. This vast web of species is also involved in supporting ecosystem function. Some of their roles are known, such as the function of insects in pollination. Sustainability and forest productivity depend partly on some level of biological diversity, but much remains to be learned about these relationships and thresholds.

Biological diversity has been reduced in the United States since Euro-American settlement. Of the 20,892 known vertebrate and vascular plant species, 1% are presumed to be extinct, and another

31% are considered at risk (global conservation status ranks of vulnerable, imperiled, or critically imperiled). In Wisconsin, there are four species presumed or possibly extinct, and less than 3% of vertebrate and vascular plants are considered at risk. Thus, we have relatively good opportunities to conserve most of our native species.

Economic: Biological diversity has direct economic value as a source of materials, food, and medicines. It also has indirect value in providing ecosystem services—for example, bird species limit populations of insect pests, and wetland plants filter pollutants and sediment from aquatic systems. Income from forest-based tourism and recreation is largely dependent on the vegetation and wildlife found in an area.

Sometimes, conserving certain aspects of biological diversity is part of the reason for protecting land areas from the effects of humans. Reserved areas can create economic impacts due to restrictions on resource production or motorized forms of travel. Currently, 1.3 % of forested lands in Wisconsin are in a reserved status.

Gathering information about biological diversity is expensive, requiring detailed research, inventory, and monitoring.

Social: Most people do not want species to become extinct. Some are concerned about potential consequences, including the failure of ecological systems to function properly. Others are worried that future generations will lack materials, food, and medicines, or may have a diminished quality of life. Still others have ethical and religious beliefs about maintaining life on Earth.

Some people are not very concerned about the loss of biological diversity, reasoning that many species are of little importance to humans, and that the Earth is so resilient that other species or ecological functions will develop to compensate for those that are lost. They may also feel that protection measures interfere with human resource use and economic development, and are too expensive.

The lack of appropriate information about biological diversity can result in poor land use decisions, incorrect assumptions by the public, and questions about land use.

Comments on next page

Comment—Developing Options

A5. Issue: **Information about biodiversity is scarce**

Please check one:

- ☐ I am interested in this trend/issue and wish to provide comments (*Please go to options below.*)
- ☐ I am NOT interested in this trend/issue and do not wish to respond (*Please go to next page.*)
- ☐ I am interested in this trend/issue BUT I can not comment because (*Please check one.*)
- ☐ Too complex ☐ I need more information ☐ Other _____

Options

Please circle one response for each option.

- A. Take no action regarding biodiversity.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- B. Study biological diversity and wait to take action until more information is available.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- C. Manage to protect biological diversity while conducting studies to understand the issue in greater detail.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- D. Identify those species for which special management is needed and develop and implement management guidelines ("fine-filter" approach).

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- E. Maintain managed landscapes with components of structure and composition that mimic some parts of historic conditions, in the expectation that some species may benefit from these components ("coarse-filter" approach).

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- F. Maintain reserves where natural processes, like fire and wind disturbance, control forest structure and composition.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- G. Collaboratively develop plans that utilize a combination of coarse and fine fine-filter approaches, and including some reserve areas.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

Suggest changes to existing option(s) or recommend another option(s) and/or general comments about the trend/issue, implications and/or options.

A6. Issue: It is a challenge to make scientific information relevant to decision-making.

Issue Definition

Forests are complex. Describing even what we do know about forests in ways that can be readily understood and used by people who want to participate in planning for future forest management is an increasing challenge for natural resources professionals. The good news is that with tools such as Geographic Information Systems (GIS), we can provide very useful visual aids to help people think about multiple layers and scales of information.

Implications

Ecological: Forest systems are typically complex and often not fully understood. The information that exists about the ecology of forests has traditionally been written by and for scientists and is not easy for non-scientists to understand. Ecological information is often developed only in the context of ecology and is usually not integrated with any social or economic information.

Economic: Wisconsin's forests support a major component of Wisconsin's economy, through production, tourism, and employment. The paper industry, the tourism industry, and secondary wood products industry are all primary users of our forests and employers of our citizens. So the forces of economic supply and demand play a powerful role in the wants, needs, and values that many citizens have for forest resources.

Social: For the purposes of natural resources protection and management, "social" information generally means information about what people want, need, and value from the natural resources of their neighborhood, state, and beyond. In recent years, citizens have become much more informed and involved in decision-making about Wisconsin's forests, and they want a meaningful opportunity to participate. More than ever, public policy about protecting and managing Wisconsin's forests must address the concept of multiple use, whereby many different—and sometimes conflicting—wants, needs, and values are acknowledged and provided for.

Comment—Developing Options

A6. Issue: **It is a challenge to make scientific information relevant to decision-making**

Please check one:

- ☐ I am interested in this trend/issue and wish to provide comments (*Please go to options below.*)
- ☐ I am NOT interested in this trend/issue and do not wish to respond (*Please go to next page.*)
- ☐ I am interested in this trend/issue BUT I can not comment because (*Please check one.*)
- ☐ Too complex ☐ I need more information ☐ Other _____

Options

Please circle one response for each option.

- A. Continue with present level of investment and effort, recognizing that ecological, social, and economic information will continue to be relatively fragmented and nonintegrated.
- | | | | |
|-------|-----------------------------|--------|--|
| 1 | 2 | 3 | 4 |
| Favor | Neither favor
nor oppose | Oppose | I don't understand,
need more information |
- B. Invest further in tools such as GIS that can help to integrate ecological, social, and economic information in visual ways that many more people can make sense of.
- | | | | |
|-------|-----------------------------|--------|--|
| 1 | 2 | 3 | 4 |
| Favor | Neither favor
nor oppose | Oppose | I don't understand,
need more information |
- C. Invest further in professional expertise in public participation and preparing complex information for the purpose of public participation.
- | | | | |
|-------|-----------------------------|--------|--|
| 1 | 2 | 3 | 4 |
| Favor | Neither favor
nor oppose | Oppose | I don't understand,
need more information |
- D. Develop computer models that will combine ecological, social, and economic information for the purposes of decision-making.
- | | | | |
|-------|-----------------------------|--------|--|
| 1 | 2 | 3 | 4 |
| Favor | Neither favor
nor oppose | Oppose | I don't understand,
need more information |

Suggest changes to existing option(s) or recommend another option(s) and/or general comments about the trend/issue, implications and/or options.

A7. Trend: The list of threatened and endangered species is growing.

Trend Definition

Currently there are 33 threatened and 34 endangered forest species listed on either the Wisconsin or federal endangered and threatened lists. These numbers are up from 1985, the time of the last assessment. These latest listings are concentrated in the invertebrate and plant categories. The increase in listed species is largely due to our increasing knowledge about a wider variety of species and their habitat needs.

Implications

Ecological: In addition to the 33 threatened and 34 endangered species directly associated with forests, there are many additional listed species whose populations may be affected in part by forestry activities. In Wisconsin, there are currently a total of 133 endangered and 106 threatened species, and many additional species of concern. Usually, these species are not harmed by activities that use ecosystem-based sustainable forestry practices. Several types of rarity can lead to listing: some species are “specialists” that are naturally restricted to uncommon habitats; some species are scarce within abundant habitat because of life history factors; others are at the edge of their range. Another category of species is listed because their populations have declined to low levels, primarily due to habitat loss or degradation, or for a few, exploitation (overhunting or overfishing) or persecution. Species are occasionally delisted when additional inventory information indicates that the species is more common than previously believed, or when population trends are reversed and the species becomes more common.

While most Wisconsin species are not monitored for population trends, a number of bird species are known to have declined significantly since the 1960's, based on BBS (Breeding Bird Survey) information. These include olive-sided flycatcher, eastern wood-pewee, wood thrush, veery, golden-winged warbler, and indigo bunting. An additional group of birds has declined during the past decade. These monitoring results provide support for the assertion that some species are becoming increasingly rare.

The major ecological implications of increasing species rarity are that extirpation or extinction becomes more likely, and that ecosystem functions can be affected. Although extinction is a natural process, current and projected rates of extinction worldwide are much greater than what would be expected without effects of humans. And, while past human-caused extinctions were largely due to exploitation, future extinctions are expected due to continued loss, degradation, and fragmentation of habitats. The loss of species could affect ecosystem functions like pollination and nutrient cycling, although the exact role of any given species is usually not known.

Economic: Some species have direct economic value as a source of materials, food, and medicines. Although we would not ordinarily use rare species in these ways, future generations may find them useful, particularly for genetic material. Rare plants are sometimes propagated for sale, and command a high price. Theft of wild plants and animals is a problem because their value on the black market is very high. Some rare species may be valuable in providing ecosystem services like pollination and nutrient cycling. Some tourism is based on rare species, such as at the International Crane Foundation's center near Baraboo, where people visit to observe a variety of rare cranes.

Protection and management of threatened and endangered species can be very expensive in some instances, and may limit some uses of resources.

Social: Most people do not want species to become extinct. Some are concerned about potential consequences, including the failure of ecological systems to function properly. Others are worried

that future generations will lack materials, food, and medicines, or may have a diminished quality of life. Still others have ethical and spiritual beliefs about maintaining life on Earth.

Some people are not very concerned about potential losses of species, reasoning that many of them are of little importance to humans, and that the Earth is so resilient that other species or ecological functions will develop to compensate for those that are lost. They may also feel that protection measures interfere with human resource use and economic development, and are too expensive.

Comment—Developing Options

A7. Trend: **The list of threatened and endangered species is growing.**

Please check one:

- ☐ I am interested in this trend/issue and wish to provide comments (*Please go to options below.*)
- ☐ I am NOT interested in this trend/issue and do not wish to respond (*Please go to next page.*)
- ☐ I am interested in this trend/issue BUT I can not comment because (*Please check one.*)
- ☐ Too complex ☐ I need more information ☐ Other _____

Options

Please circle one response for each option.

- A. Take no action specific to threatened and endangered species, expecting populations of listed species will continue to decline, and that the list of threatened and endangered species will grow.
- | | | | |
|------------|----------------------------------|-------------|---|
| 1
Favor | 2
Neither favor
nor oppose | 3
Oppose | 4
I don't understand,
need more information |
|------------|----------------------------------|-------------|---|
- B. Identify and implement management guidelines to conserve rare species (“fine-filter” approach).
- | | | | |
|------------|----------------------------------|-------------|---|
| 1
Favor | 2
Neither favor
nor oppose | 3
Oppose | 4
I don't understand,
need more information |
|------------|----------------------------------|-------------|---|
- C. Maintain managed landscapes with components of structure and composition, including advanced age-classes, to partially mimic historic conditions, in the expectation that some species may benefit (“coarse-filter” approach).
- | | | | |
|------------|----------------------------------|-------------|---|
| 1
Favor | 2
Neither favor
nor oppose | 3
Oppose | 4
I don't understand,
need more information |
|------------|----------------------------------|-------------|---|
- D. Maintain reserves where natural processes like fire and wind disturbance control forest structure and composition.
- | | | | |
|------------|----------------------------------|-------------|---|
| 1
Favor | 2
Neither favor
nor oppose | 3
Oppose | 4
I don't understand,
need more information |
|------------|----------------------------------|-------------|---|
- E. Collaboratively develop plans that utilize a combination of the coarse and fine filtered approaches, and some reserves.
- | | | | |
|------------|----------------------------------|-------------|---|
| 1
Favor | 2
Neither favor
nor oppose | 3
Oppose | 4
I don't understand,
need more information |
|------------|----------------------------------|-------------|---|

Suggest changes to existing option(s) or recommend another option(s) and/or general comments about the trend/issue, implications and/or options.

→ *Go to next page*

A8. Issue: Invasive exotic species are an increasing threat.

Issue Definition

Invasive exotic species—insects, diseases and plants—have been introduced into Wisconsin over a period of many years. Human activities—trade, travel, gardening, and recreation—have resulted in the accidental and intentional introduction of many species that are damaging to forests. New introductions continue and more can be expected. Diseases such as Dutch Elm Disease and Butternut Canker have devastated their host tree species because the native tree species lack genetic resistance. Exotic insects and plants (gypsy moth and garlic mustard for example) sometimes have the advantage of few competitors and natural enemies; their populations build up to very high levels that kill and displace native tree and plant species. The loss of native species has changed the structure and reduced diversity of many of Wisconsin's forest ecosystems. Gypsy moth and garlic mustard have only recently begun to impact Wisconsin's forests and are rapidly increasing their areas of infestation; therefore, a greater impact over a larger area can be expected.

Implications

Ecological: The loss or reduction of native trees, shrubs and herbaceous plants has a cascading effect on the fauna that depend on them. For example, gypsy moth defoliation reduces the oak acorn crop for several subsequent years; consequently, natural reproduction is reduced and many animals that depend on acorns for food will be reduced or lost to the ecosystem. The loss of shrubs and herbaceous plant species causes a reduction or loss of many insects, birds, rodents and the predators that feed on them. White pine blister rust has significantly reduced our ability to grow white pine in selected high-risk areas.

Economic: Elm and butternut are no longer available as a raw product for the timber industry. Oak species are present at reduced levels following gypsy moth outbreaks. The loss of oak shade trees reduces residential property values. Millions of dollars are spent annually by government and private sector to control gypsy moth, garlic mustard, buckthorn, and other invasive species. Commercial camping industry loses income during gypsy moth outbreaks. The potential impact of white pine blister rust has discouraged land managers from planting this species thus reducing its availability as a source of wood products.

Social: Recreational opportunities are lost due to high gypsy moth populations that many people find repulsive. Anxiety is intense and homeowners feel that their quality of life is reduced during outbreaks. Citizens blame governmental agencies that are unable to respond to various problems caused by exotic species leading to loss of governmental credibility. Citizens put pressure on governmental agencies to take action.

Comment—Developing Options

A8. Issue: **Invasive exotic species are an increasing threat.**

Please check one:

- ☐ I am interested in this trend/issue and wish to provide comments (*Please go to options below.*)
- ☐ I am NOT interested in this trend/issue and do not wish to respond (*Please go to next page.*)
- ☐ I am interested in this trend/issue BUT I can not comment because (*Please check one.*)
- ☐ Too complex ☐ I need more information ☐ Other _____

Options

Please circle one response for each option.

- A. Take no action. Allow for invasive, exotic species to invade and establish within forests. Accept the changes that will occur in the forests due to the impact of these insects, diseases and plants.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- B. Actively manage state lands to preclude or minimize the impacts of invasive, exotic species. Inform other public and private forest landowners of the status of invasives, and of management approaches and techniques to minimize impact.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- C. Aggressively work to minimize the impact of invasive species on all forestlands collaborating with public agencies and private partners. Invest in the development of exotic disease resistant forest species and utilize environmentally safe control measures to minimize insect and plant infestations.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

Suggest changes to existing option(s) or recommend another option(s) and/or general comments about the trend/issue, implications and/or options.

A9. Issue: Some biotic communities, and important development stages of biotic communities, are rare.

Issue Definition

Savannas, barrens, hemlock relicts, and old-growth forests are examples of biotic communities that have become extremely rare. Savannas were once common, but have been converted to farmland, succeeded to forest, or changed in land use to urban development. Barrens were historically rare and now have become globally imperiled. These forest systems have also been altered in their composition, for example through increased plantations or stocking of trees in barrens and savanna, as well as through fire suppression in systems that are fire-dependent. Hemlock relicts are declining due to deer damage, poor regeneration, and conversion of land to other uses.

Implications

Ecological: Rare community types in Wisconsin and the Great Lakes region have been identified through several efforts undertaken by different agencies. The more general assessments have noted the rarity of prairie, savanna, barrens, and certain types of wetlands. Statewide assessments have emphasized the lack of prairies, oak savannas, and pine and oak barrens.

The Wisconsin Natural Heritage Inventory (WI NHI) lists 102 natural communities that are rare in the state. Of these, 37 are identified as threatened or endangered. Some of these are naturally rare, like caves and talus slopes, but others were once widespread and have potential for restoration. Rare community types tend to include rare species, and maintaining their integrity is important in conserving the rarer components of biological diversity in the state.

Concerns about rare biotic communities are focused on component species that are declining or not regenerating, as well as the restricted extent of some other community types. Forest managers have been concerned for some time about regeneration of cedar, hemlock, yellow birch, and in some cases, oak forests. Efforts are ongoing in developing regeneration techniques, but meanwhile these forest types may decline further. A number of restoration projects have been conducted in pine and oak barrens, and oak savannas. Restored areas are small compared with the former extent of these community types, and additional restoration may be needed to prevent declines of species' populations that utilize them.

Rare natural features of small extent are often contained within a forested matrix. These may include different types of wetlands, ponds, lakes, and streams. Other features less frequently found in forests are seeps, cliffs, rookeries, hibernaculums, and caves. Usually, these natural features and the biotic communities they support are not harmed by forestry activities that use sustainable ecosystem-based management practices. However, development and some recreational activities may affect them. Additional declines of rare communities would lead to the effects discussed in the biological diversity issue.

Old-growth forests are very rare because they were nearly completely removed in the "Cutover" period of Wisconsin's history (generally 1890's). There currently is very little forested area dominated by trees older than 120 years. The lack of old-growth forests results in lower populations of species that prefer or are more productive in them, and may have other ecosystem effects. Additional discussion is found in the issue, A11, "Stands of old forest are rare".

Economic: Some rare ecosystems support species that have potential economic value as a source of materials, food, and medicines. Some of them are valuable in providing ecosystem services; for example, wetlands are effective in trapping pollutants and sediments. Some tourism is based on rare ecosystems; for example, people will travel to observe a prairie remnant or a cave, and for recreation on or near lakes.

If areas are designated as reserves to protect rare communities or features, the opportunity for direct resource production from these lands is precluded. Currently, 1.3 % of forested lands in Wisconsin are in a reserved status. Also, there are economic costs associated with incorporating conservation measures into sustainable forest management practices.

Social: Many people value Wisconsin's natural communities, feeling a connection to lakes, rock formations, and other natural features, some of which are historic communities. They are concerned when these areas are destroyed or degraded.

Declines of rare ecosystems also lead directly to declines of rare species. Consequences of species loss are discussed in the issue, A5, "Information about biological diversity is scarce."

Comment—Developing Options

A9. Issue: **Some biotic communities, and important development stages of biotic communities, are rare.**

Please check one:

- ☐ I am interested in this trend/issue and wish to provide comments (*Please go to options below.*)
- ☐ I am NOT interested in this trend/issue and do not wish to respond (*Please go to next page.*)
- ☐ I am interested in this trend/issue BUT I can not comment because (*Please check one.*)
- ☐ Too complex ☐ I need more information ☐ Other _____

Options

Please circle one response for each option.

- A. Take no action, with the expectation that rare ecosystems will continue to be rare.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- B. Collaboratively identify and implement management guidelines for rare ecosystems.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- C. Maintain managed landscapes with components of structure and composition to partially mimic conditions found in rare ecosystems.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- D. Restore and expand some of the rare forested ecosystems that have been lost or degraded due to human influences.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

Suggest changes to existing option(s) or recommend another option(s) and/or general comments about the trend/issue, implications and/or options.

A10. Trend/Issue: Forest disturbance patterns are changing.

Trend/Issue Definition

Forest disturbance patterns have changed dramatically over the past century. This has resulted in significant impacts upon forest composition, structure, and function. Once, the dominant short-term disturbance factors in Wisconsin's forests were windthrow, fire, disease, and severe weather. Today, fire has been widely suppressed in our forests. Human-caused disturbance is now predominant in Wisconsin's forests, while insects, disease, windthrow, and severe weather continue as disturbance factors. Various types, intensities and timing of disturbance have different impacts on forest composition, structure and function.

Implications

Ecological: Disturbance regimes (type, timing, intensity) have changed significantly in recent history. Prior to Euro-American settlement, fire was an important agent causing disturbances ranging from light and small to intense and large. This agent of forest change has been dramatically reduced (see Issue A14). Characteristics of other agents of disturbance have also changed, including insects, disease, animals, wind, ice, and flooding. Significant new disturbance factors have been incorporated into the forest ecosystem, including climate change, pollution, exotic pests, human recreation, logging, and land use conversion. As a result of these changing disturbance patterns, relative abundances and distributions of forest cover types and successional stages have changed significantly, impacting other plants and animals that are part of these systems.

Insect and disease infestations may either remove a single species, hasten succession, or alter species composition in forest stands. Oak wilt and the two-lined chestnut borer, butternut canker and Dutch elm disease have all reduced the incidence of specific tree species in either very localized areas or statewide. The jack pine budworm has played a significant role in killing mature to overmature jack pine. Heavy defoliation of hardwoods by insects causes mortality to suppressed and weakened trees and initiates decline of more vigorous trees. Depending on the tree species involved, succession may be hastened as understory species are released or species composition may change if the site is suddenly receiving more sunlight and conditions encourage the growth of intolerant species. Wildlife habitat quality and quantity may change as patches of declining hardwoods die and added sunlight to the forest floor encourages the temporary growth of shrubs. This undergrowth may serve as shelter for birds and small mammals. Dead trees harbor insects for birds, perches for raptors and provide den sites. However, too many dead trees can eliminate mast as a source of food and temporarily reduce water infiltration and increase runoff.

Severe downburst wind storms cause significant localized damage to northern hardwoods through defoliation and severe injury. Large wounds, cracks and stem failure reduce vigorous trees to weak and low vigor trees. Low-vigor trees are more susceptible to the pine bark beetle or Armillaria root disease. Windthrow of one or a few trees was the dominant form of disturbance in hemlock-hardwood forests prior to Euro-American settlement, creating small gaps throughout the forests. Gap formation continues, but at a lower rate in today's younger forests. The lack of small forest gaps may be a factor in the decline of some species.

Human disturbance in forests occurs from recreational and timber harvesting activities. Forests are generally thought to be resilient to these impacts, but there are concerns about long-term cumulative effects of soil compaction, root damage, nutrient removals, increased herbivory and reductions in ground-flora abundance. These stressors have contributed to forest decline in

Europe; they weaken trees and make them more susceptible to insects, disease, and effects of pollution.

Economic: As butternut and oak are removed from selected sites in Wisconsin, they are often replaced by species that produce less valuable timber products. Insects, diseases and major windstorms often cause decline and mortality of timber before they reach economic maturity. Time and money invested in growing species is lost. Resources may have to be spent on unplanned harvests and site preparation to minimize losses and initiate regeneration. Severe defoliation or widespread mortality of Wisconsin's forests reduces their aesthetic value and can have an impact on revenues from tourism.

Social: Some insects present a health hazard, especially the gypsy moth, through the release of body hairs. People with respiratory illnesses will be particularly susceptible to irritation by the widespread presence of these hairs. Dieback and mortality of trees can produce hazardous situations if the trees are located in areas where the public frequents. Injuries from falling branches or falling trees must be minimized, thus hazardous trees will have to be removed. If the quality or quantity of wildlife habitat is reduced, hunting opportunities may also be reduced for a variety of game species.

Comment—Developing Options

A10. Trend/Issue: **Forest disturbance patterns are changing.**

Please check one:

- ☐ I am interested in this trend/issue and wish to provide comments (*Please go to options below.*)
- ☐ I am NOT interested in this trend/issue and do not wish to respond (*Please go to next page.*)
- ☐ I am interested in this trend/issue BUT I can not comment because (*Please check one.*)
- ☐ Too complex ☐ I need more information ☐ Other _____

Options

Please circle one response for each option.

- A. Take no action other than monitor disturbances as they occur, documenting changes in the forest.

1 Favor	2 Neither favor nor oppose	3 Oppose	4 I don't understand, need more information
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- B. Manage for healthy vigorous forests that are more tolerant of insect outbreaks and disease.

1 Favor	2 Neither favor nor oppose	3 Oppose	4 I don't understand, need more information
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Suggest changes to existing option(s) or recommend another option(s) and/or general comments about the trend/issue, implications and/or options.

A11. Issue: Stands of old forest are rare.

Issue Definition

Since the “Cutover” period of Wisconsin’s history (generally 1890’s), what people think of as old forest in Wisconsin has been relatively rare, with notable exceptions of stands of old forest in the Menominee Forest (Menominee County), on Goodman Timberland, and in the Connor Forest (Marinette, Forest and Florence Counties). What remains as scattered old-growth remnants of presettlement forests is scattered across the state in very small parcels, mostly in cedar bogs or spruce swamps. Our aging forests provide opportunities to encourage development of and manage for old forest.

Implications

Ecological: The primary forests of Wisconsin, which existed early in the Euro-American settlement period, were considerably older than present forests. One study estimated that trees older than 120 years dominated 90% of the area of hemlock-hardwood forest. Almost all of the primary forest was removed in the Cutover, and the re-growth is now largely in the 20-80 year old age-classes. Forest stands with dominant age-classes older than 100 are uncommon. Data from the latest inventory cycle show that total acreage of stands older than 100 years decreased between 1983 and 1996.

There are ecological benefits associated with landscapes that contain old forests and old-growth as an integral element. Ecological simplification is reduced and biological diversity is augmented. Compositional, structural, and functional diversity are increased. Until recently no known old-growth obligate species (species that can exist only in old-growth conditions) had been identified in Lake States forests, however a group of lichens has been identified which appear to be obligate on old-growth. Some bird species are more productive in old forest and old-growth. Coarse woody debris, which is abundant in some old forests, and pit-and-mound topography, created by treefalls, are known to be important habitat features for some plants and animals.

Specific ecological values of old-growth forests in Wisconsin and the eastern US are largely unknown, because stands and larger forest patches are rare. Old-growth forests, with their relatively undisturbed conditions, provide reference points for the study of ecological characteristics and for comparison with managed forests. One benefit of allowing some managed forests to age would be to learn more about the functions and values of old forests.

Economic: Forests provide ecosystem services and support species that have direct economic value as a source of materials, food, and medicines. Old forests may provide different kinds and amounts of services and supplies. For example, managing for older forests may reduce total timber volume yields, but increase large sawtimber and veneer yields. Older forests have increased risks of losses in timber value. Designation of stands and forested landscapes for the development of old-growth reserves would eliminate direct material resource production from these lands. Tourism could benefit somewhat from additional old forest land, as people will travel to observe these areas. Populations of popular game species could decline in some landscapes with a large component of older forests.

Social: Old forests provide a human environment with educational, aesthetic, and philosophical values. Some people value old forests, feeling a connection to them as a significant natural feature that was part of Wisconsin’s heritage. Social conflicts arise from different values assigned to different ecological, economic, and social implications associated with different levels of landscape representation of different kinds of managed and reserved old forests.

Comment—Developing Options

A11. Issue: **Stands of old forest are rare.**

Please check one:

- ☐ I am interested in this trend/issue and wish to provide comments (*Please go to options below.*)
- ☐ I am NOT interested in this trend/issue and do not wish to respond (*Please go to next page.*)
- ☐ I am interested in this trend/issue BUT I can not comment because (*Please check one.*)
- ☐ Too complex ☐ I need more information ☐ Other _____

Options

Please circle one response for each option.

- A. Take no action, with the expectation that old forests, outside of reserves, will not significantly increase.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- B. Protect remaining old-growth (relict forest) remnants where possible.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- C. Develop and encourage management strategies and partnerships to develop and increase representation of different kinds of old forests (old-growth reserves, managed old-growth, extended rotations and managed forests that include old-growth features) within a variety of landscapes.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- D. Encourage the development of old forests to the greatest extent possible across Wisconsin.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

Suggest changes to existing option(s) or recommend another option(s) and/or general comments about the trend/issue, implications and/or options.

A12. Issue: The forest is becoming more fragmented.

Issue Definition

Permanent fragmentation is the process of converting large contiguous areas of forest into smaller patches of forest and non-forest land use in ways that do not allow the forest to regenerate. In contrast, habitat fragmentation temporarily decreases the continuous area of a similar-aged or structured forest, which may impact some species. Temporary habitat fragmentation occurs naturally through agents such as fire, windthrow, or severe weather and by human activity, particularly logging. Humans have increased the amount and rate of permanent and habitat fragmentation in Wisconsin's forests. Road building, agriculture, and urban development all contribute to permanent fragmentation. However, there are dramatic differences between the impacts of temporary habitat fragmentation, such as timber harvest, which provides for regeneration of the forest, and fragmentation under conditions that create permanent or very long-term alterations to forest systems, such as development and agriculture. Like many of the issues identified in this section, this one is much debated.

Implications

Ecological: There are several ecological effects of forest fragmentation. Permanent fragmentation results in long-term habitat loss, which is widely held to be the greatest threat to species survival. This type of fragmentation also creates areas that some wildlife species are unable or unwilling to cross, or where they are more likely to be killed.

"Edge effects" occur at the boundaries of two distinctly different habitats. Effects are most severe at boundaries between forests and open areas, and last longest where forest adjoins permanently fragmented areas. Habitat fragmentation is not so long-lasting; even in the most extreme cases, where the forest is completely removed, effects are mitigated for most species within several decades. Some forest plants and animals benefit from edge conditions, while others are harmed. Species composition alters toward "generalist" species that can tolerate disturbance and a variety of habitats. Generalists include many common prey species that provide food for hawks, bobcats, and other predators. Some species are habitat "specialists" that can be negatively affected by some types of edge. Effects have been most often studied on neotropical migratory birds (NTMBs) that winter in tropical areas and migrate to the Lake States to nest. Many NTMBs have undergone severe population declines during the past 30 years. Some of these bird populations have declined partly because of edge effects, including competition for food or nest sites, predation, or nest parasitism. Edge effects are worse for NTMBs in southern Wisconsin, because forests there are permanently fragmented within an agricultural landscape. These forest patches have more edge, and cowbirds are common nest parasites.

"Area effects" are related to the size of habitat patches, as well as their distribution. Some species are "area sensitive", showing a preference for large habitat patches where they can presumably avoid predation, human disturbance, or edge effects. Fragmented landscapes have more edge and fewer large habitat patches. Such landscapes are less suitable for area sensitive species with specific habitat requirements.

At a broader spatial scale, "landscape effects" are due to cumulative changes in land use, forest composition and age-class structure, and the size and arrangement of different kinds of habitat patches. Some NTMBs tend to avoid landscapes that contain a lot of open land.

Economic: Permanent fragmentation is associated with development, which has both positive and negative effects. Some types of development can attract increased tourism and associated revenue,

but industrial and/or residential development in forest-based recreation areas could reduce the destination desirability for visiting tourists. Also, some developments require additional services like police and fire protection that cost communities more than they receive from increased tax revenues. Habitat fragmentation associated with timber harvest provides income and products, but can sometimes have a temporary negative effect on scenic quality. Harvests can also improve visual quality by reducing forest highway tunnel effects, or opening views of lakes and hills.

Permanent fragmentation reduces the available forest product base. This can result in detrimental impacts on local forest-dependent economies. With increased competition and land prices for a smaller, more fragmented forest land base, ownerships become smaller and landowners are less likely to harvest timber or draw interest from timber buyers if they are willing to harvest.

If native species are lost because of fragmentation, long-term future options for materials and medicines may be compromised.

Social: Permanent fragmentation has a much greater social effect than habitat fragmentation. Some people enjoy living and recreating in highly developed areas, while others prefer a more rustic setting with relative solitude. As Wisconsin's landscape becomes more developed, particularly for seasonal homes, local cultures change. Seasonal residents and new permanent residents often develop additional homesites in the forest, resulting in permanent fragmentation. Surveys show that these new residents tend to favor non-commodity uses of the remaining forest, while long-term residents favor a working landscape with more habitat fragmentation but less homesite development.

Forest land prices are increasing dramatically in Wisconsin. Many landowners are forced to sell as a result of increasing property taxes, or may be lured to sell to make a large profit. Division of these lands into smaller, more affordable parcels drives the fragmentation cycle. Residents that lack knowledge about the ecological implications of fragmentation can worsen its effects by clearing additional areas near homesites for views or lawns, introducing non-native species, and feeding generalist wildlife species.

Comments on next page

Comment—Developing Options

A12. Issue: **The forest is becoming more fragmented.**

Please check one:

- ☐ I am interested in this trend/issue and wish to provide comments (*Please go to options below.*)
- ☐ I am NOT interested in this trend/issue and do not wish to respond (*Please go to next page.*)
- ☐ I am interested in this trend/issue BUT I can not comment because (*Please check one.*)
- ☐ Too complex ☐ I need more information ☐ Other _____

Options

Please circle one response for each option.

A. Allow current trends to continue

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

B. Encourage reductions in permanent fragmentation, or its effects, by:

- Providing education and information on permanent fragmentation to governments

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- On state lands, locating roads and facilities to minimize fragmentation

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- Advocating for statewide forest land zoning laws that would restrict residential expansion into forests

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- Purchasing land to make habitat patches larger and more continuous

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- Promoting the use of “light on the land” construction and landscaping for new homes in the forest.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- Promote participation in the Managed Forest Law.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- Promote purchase of development rights on large blocks of private forestland.

1	2	3	4
Favor	Neither favor nor oppose	Oppose	I don't understand, need more information

C. Reduce habitat fragmentation, or its effects, by:

- Aggregating even-aged timber harvests, so that they are clumped together in the landscape and leave other areas less fragmented

1	2	3	4
Favor	Neither favor nor oppose	Oppose	I don't understand, need more information

- Increasing rotation lengths so that less area is fragmented at any given time

1	2	3	4
Favor	Neither favor nor oppose	Oppose	I don't understand, need more information

- In Northern Hardwoods, emphasizing the use of uneven-aged harvest methods that do not create much edge

1	2	3	4
Favor	Neither favor nor oppose	Oppose	I don't understand, need more information

- Using techniques that create “soft” edges to reduce impacts in even-aged harvests

1	2	3	4
Favor	Neither favor nor oppose	Oppose	I don't understand, need more information

- Reducing timber harvest levels

1	2	3	4
Favor	Neither favor nor oppose	Oppose	I don't understand, need more information

- Providing incentives to plant more plantations on nonsensitive lands for fiber production. This could result in less harvest pressure on natural forests.

1	2	3	4
Favor	Neither favor nor oppose	Oppose	I don't understand, need more information

Suggest changes to existing option(s) or recommend another option(s) and/or general comments about the trend/issue, implications and/or options.

A13. Trend: Average acreage burned by forest fires has declined.

Trend Definition

Great strides have been made in controlling forest fires since the initial efforts to suppress fires over the 70 years ago. The annual acreage burned in Wisconsin has declined with improvements in forest fire detection and suppression techniques, saving lives, property, and forest resources. However, weather continues to play a critical role in determining the number and extent of fires in any given year. It has been more than a decade since Wisconsin has experienced prolonged severe fire weather.

Implications

Ecological: Fire, at one time, was a significant disturbance that altered the composition, structure and function of forested areas. Today, fire suppression is a necessary activity to protect human life and property. The reduction of fire, including the number, intensity and size will have ecological implications. A reduction in fire will reduce the number of early successional communities such as jack pine forest, pine barrens and oak savanna, that are dependent on fire to reproduce. Severe forest fires can also sterilize the soil, which in turn will affect the ability of plants to germinate. This leaves the soil exposed to wind and rain erosion.

Economic: Forest fires can have a significant impact on the areas that they have burned, especially if they destroy either property or the current timber resource and the future seed trees to regenerate the area.

As more marginal farmland is converted over to vegetation and more and more homes are built in the forested areas of the state, the threat of forest fires and the potential loss of lives and structures to forest fires will continue to increase in the future. This is especially true in the wildland-urban interface area of Wisconsin, where communities and forest land intermix.

Social: With continued population growth, fragmentation of forest land and construction of primary and secondary homes in the forested areas of the state, the wildland-urban interface area continues to expand in Wisconsin. It is primarily in this wildland-urban interface area that wildland fire causes structural losses. Because more and more people like to live and recreate in forested areas, this will cause more structures to be imperiled by future forest fires.

During a forest fire, significant amounts of smoke are generated, which can have significant impacts on people that have respiratory problems. Smoke can also impair visibility along highways. This is especially true at night when the smoke settles to the ground and becomes denser, reducing visibility.

Comment—Developing Options

A13. Trend: **Average acreage burned by forest fires has declined.**

Please check one:

- ☐ I am interested in this trend/issue and wish to provide comments (*Please go to options below.*)
- ☐ I am NOT interested in this trend/issue and do not wish to respond (*Please go to next page.*)
- ☐ I am interested in this trend/issue BUT I can not comment because (*Please check one.*)
- ☐ Too complex ☐ I need more information ☐ Other _____

Options

Please circle one response for each option.

- A. Reduce the amount of fire suppression for natural caused fires at the expense of potential loss to human life, buildings and resources.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- B. Continue to evaluate the capabilities of the Forest Fire Suppression Program and that of partner agencies to insure adequate levels of protection.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- C. Increase the amount of suppression and prevention programs in the wildland-urban interface to educate landowners on means to prevent forest fires and to provide defensible space for their homes.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- D. Encourage development in areas of lower fire risk and discourage development in areas of high fire risk.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

Suggest changes to existing option(s) or recommend another option(s) and/or general comments about the trend/issue, implications and/or options.

A14. Issue: Control of fire affects forest composition.

Issue Definition

The control of forest fires in Wisconsin is a necessity given the juxtaposition of forests, people and property. The suppression of forest fires affects the composition, structure and function of forests by facilitating the conversion of non-forested land to forest, and by altering natural disturbance regimes. Prescribed fire is increasingly used as a tool to mimic the attributes of fire in maintaining some forest and non-forest ecosystems, including prairie, oak savannas and pine barrens.

Implications

Ecological: Fire was a major presettlement disturbance factor in Wisconsin. It was particularly significant across much of southern Wisconsin, and on dry, sandy areas in the north. Approximately 40-45% of Wisconsin's land surface was covered by fire dependent communities prior to Euro-American settlement. Native people used fire to manage natural communities, but the extent of impacts is uncertain. Fire type, intensity, and timing influence significantly forest and wild land composition, structure, and function. Fire as a major disturbance factor has nearly been eliminated from the landscape. Natural succession governed by climate, site characteristics, species adaptations, and other types of disturbance is proceeding. Prairies and savannas depend on fire for their maintenance and renovation, and have become rare in Wisconsin. Development and agriculture have claimed most prairies and savannas and to a lesser degree succession to forests has contributed to this problem. Jack pine—scrub oak forests and barrens also depend on fire for their maintenance and renovation. Large acreage's of this cover type were converted to jack pine and red pine plantations following the early settlement cutover and fires. Now they are succeeding to white pine, red maple, and oak forests or converted to red pine plantations. Natural stands of red pine are fire dependent. Remnant stands do exist, but regeneration is lacking. Oaks, white birch, and aspen take advantage of conditions created by fires to regenerate and compete. These species currently are relatively common due to conditions created by the cutover and the fires that followed; however, there are regeneration concerns associated with each. Following the control of fire, significant changes in landscape structure have occurred. Open land has been developed or has succeeded to forestland, and the forests are developing some mid to late successional compositional and structural attributes. Functional processes have changed significantly following compositional and structural change and human development. Some plants and animals primarily associated with fire dependent open wild lands are now rare. As fire dependent communities become rare, species abundances change, and species richness may be reduced.

Economic: Fire control is necessary in today's environment. It protects human life, property, and material resources. Natural resources associated with forests have higher market values than do natural resources associated with prairies, savannas, and barrens. Greater use of prescribed fire in forests and woodlands can result in decreased timber quality and value due to tree damage caused by fire.

Social: Control of fire protects human life and property. Human development in fire prone areas increases risks to human life and property, increases fire ignition potentials, increases fire protection exigencies, and limits forest management alternatives. Recreational opportunities associated with wild open land ecosystems are significantly limited. There can be conflict between forest and prairie-savanna-barrens enthusiasts and users.

Comment—Developing Options

A14. Issue: **Control of fire affects forest composition.**

Please check one:

- ☐ I am interested in this trend/issue and wish to provide comments (*Please go to options below.*)
- ☐ I am NOT interested in this trend/issue and do not wish to respond (*Please go to next page.*)
- ☐ I am interested in this trend/issue BUT I can not comment because (*Please check one.*)
- ☐ Too complex ☐ I need more information ☐ Other _____

Options

Please circle one response for each option.

- A. Accept changes to natural systems associated with fire control.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- B. Utilize human controlled disturbance, such as prescribed burns and some logging and site preparation practices, to mimic some aspects of pre-Euro American fire regimes.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- C. Under specific conditions, if there is no threat to human life or property, allow wildfires to burn. Impacts on timber values will need to be included in the decision making process.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

Suggest changes to existing option(s) or recommend another option(s) and/or general comments about the trend/issue, implications and/or options.

B1. Issue: Succession is changing forest composition and potential forest products.

Issue Definition

Wisconsin's forests are maturing, succeeding from an aspen-birch dominated composition to maple-basswood and other mid-to late-successional forest types. This change in species composition will have a major impact on the forest industry and the goods it produces. The transition of Wisconsin's northern forests from early succession to late succession forest types is a key factor that will affect the forest industry in the future. This transition will cause the industry to adapt to use more soft hardwoods, such as red maple, for both pulpwood and sawlogs. Along with this transition to later successional forests will increase tree size in the predominate species, such as maple, which will improve supply to sawmills. The southern forests in Wisconsin are predominately oak-hickory forest type and are transitioning to maple-basswood and elm-ash-soft maple types. In this part of the state there may be a greater dependence on the production of pulpwood and a consolidation of sawmills due to a reduction of sawtimber supply from the southern broadleaf forest.

Implications

Ecological: Wisconsin forests have historically been in constant successional change influenced by management and disturbance regimes. In Wisconsin, much of our forestland is succeeding to the maple-basswood type. Through management, we will be able to maintain the pioneer aspen-birch type on sites most appropriate for these species, but the acres will continue to decline. Aspen-birch forest type acreage in 1983 was 3.8 million acres and by 1996 had declined to 3.4 million acres. The maple-basswood forest type acreage in 1983 was 4.1 million acres and increased by 1996 to 5.3 million acres. Wildlife species that prefer mid to late successional forests will benefit from this change while species preferring early successional forests will decline.

Economic: This change in the resource will create some economic opportunities and reduce others. The forest industry historically has been very adaptable. If the forest resource is available at an economical price, the industry will make the capital investments needed to change. Not all industry will be adaptive, so some will cease to exist while others will thrive. Much like a biological system, those that can adapt will continue, while those that choose not to adapt, will not. The important factor influencing the industry's ability to adapt is industry understanding of the time frame and how the resource is going to change, so they can plan for the future. The forest industry has grown from \$8 billion of shipments in 1982 to about \$19 billion in 1997. This growth has occurred with a changing resource and can continue to grow with sustainable management of Wisconsin's forests.

Social: The demand for wood products is increasing. We use about 70 cubic feet of wood per person per year in the United States. As population increases, demand increases. The social impacts in Wisconsin from a changing forest resource will be hardship in some communities where industry can not make the transition and increased economic well being in others that do make the transition. Forest industry jobs provide year-round support for service sector jobs and aid in the maintenance of the infrastructure needed by the tourism industry.

Comment—Developing Options

B1. Issue: **Succession is changing forest composition potential forest products.**

Please check one:

- ☐ I am interested in this trend/issue and wish to provide comments (*Please go to options below.*)
- ☐ I am NOT interested in this trend/issue and do not wish to respond (*Please go to next page.*)
- ☐ I am interested in this trend/issue BUT I can not comment because (*Please check one.*)
- ☐ Too complex ☐ I need more information ☐ Other _____

Options

Please circle one response for each option.

- A. Status quo. Let forest succession to continue but monitor and report the change.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- B. Through intensive management try to maintain the forest in its current structure.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- C. Through forest management assist in the transition to mid and late successional forest types.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

Suggest changes to existing option(s) or recommend another option(s) and/or general comments about the trend/issue, implications and/or options.

B2. Trend/Issue: Demand for forest products is increasing.

Trend Definition

There is increasing demand for wood and wood products globally, including the products that Wisconsin's forests provide. Paper, timber, furniture, crates—even syrup and wild mushrooms—are experiencing increased demand. This increase in demand can be met in a number of ways. Increased importation, increased production through forest management, shifting harvests to other states and/or countries, shifting harvest to other species, increased efficiency in production, recycling, reuse of products and shifting demand to non-forest products form the range of alternatives, all of which have environmental, economic, and social consequences.

Implications

Ecological: Current forest growth and removals is reasonably balanced in Wisconsin. There is some room for increasing the supply of soft and hard maple and reducing the supply of aspen and oak. Currently, we are harvesting approximately 70% of net annual growth. Natural forest succession will result in a larger component of maple forest types throughout the state. Wood demand is global in nature and increases as population increases. These increases have been met in the past by increased harvest, capital investments to improve efficiency and some importation of round wood. Currently, Wisconsin is basically self-sufficient in its fiber needs. Our forests currently have the biological capability to supply 10 to 15% more fiber than is currently being used. With intensive management this percentage could increase significantly through the composition and ecological characteristics of these forests would also change. With reduced management and timber availability, timber supply could be constrained and exported to other areas of the world with less commitment to sound forest management. This would favor late-successional forest types.

Economic: The estimated standing value of the timber harvested in 1996 was \$206 million. This timber was the basis for \$15 to \$19 billion in industrial output by the forest industries. The forest industry sector accounts for a little more than 3% of total state economic output. This sector also provides the stable industrial base that helps to maintain infrastructure needed by tourism industries in rural areas. Increasing demand will allow for expansion of the industry providing better opportunities to manipulate Wisconsin's forest for the desired goals, be they recreation, timber, or a combination. A change in policies reducing available timber supply would have the effect of exporting jobs to other areas.

Social: The stability of the forest industry provides stability to the state economy, and therefore the societal needs of the citizens of Wisconsin. The increasing demand may create some social conflict over land use. Opportunities to meet increasing demand may be more seriously constrained as Wisconsin becomes more populated and forestlands become more fragmented, removing them from production.

Comment—Developing Options

B2. Trend/Issue: **Demand for forest products is increasing.**

Please check one:

- ☐ I am interested in this trend/issue and wish to provide comments (*Please go to options below.*)
- ☐ I am NOT interested in this trend/issue and do not wish to respond (*Please go to next page.*)
- ☐ I am interested in this trend/issue BUT I can not comment because (*Please check one.*)
- ☐ Too complex ☐ I need more information ☐ Other _____

Options

Please circle one response for each option.

- A. Encourage sustainable forest management on private land and active management of public land for multiple uses to provide raw materials to meet human demands.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- B. Strengthen forest industry to maintain this economic sector in Wisconsin and provide economic incentives for sustainable forest management.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- C. Assist industry in improving efficiency of raw material use and exploring species supply options to produce forest products.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- D. Explore options to intensify management on selected acres using genetically improved planting stock.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- E. Discourage forest industry and forest management in Wisconsin, allowing other regions of the country and world to supply an increasing amount of our forest product needs.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

Suggest changes to existing option(s) or recommend another option(s) and/or general comments about the trend/issue, implications and/or options.

B3. Trend/Issue: Demand for forest-based recreation and associated service is increasing.

Trend/Issue Definition

More people are using Wisconsin's forests for a wider array of recreational activities which often requires more services to be provided by the forest owners or associated communities. Land managers who provide for recreation may see a changing clientele as well as more user conflicts. Providing some services such as RV campgrounds and motorized trails may preclude a more wilderness setting desired by other users. Other users may purchase their own forest lands to pursue their recreational activity. As recreationists demand more tourism based services such as lodging, restaurants and retail stores, the opportunities and character of communities within Wisconsin's forests will change.

Implications

Ecological: Recreationists seek the forest for its natural qualities but significant increases in use can result in degradation of those same qualities the users were attracted to. The potential negative impacts of more people using the same resource are wide ranging, including decreased game species (fish and wildlife), erosion on trails, introduction and spread of exotic species, disturbance of sensitive plants or animals, and new recreation facility development. Many large forest owners are selling small parcels to recreationists for vacation homes resulting in greater forest fragmentation and shoreline impacts. Secondary impacts on the resource such as pressure to develop more motels, restaurants or gas stations will result in fewer forest acres, increased fragmentation and loss of landscape-level ecological values.

Economic: Increasing forest-based recreation has the potential for increased economic activity within the communities associated with the forests. These recreationists require a variety of tourism based services including lodging, food, fuel and retail stores. This increased service demand can help diversify local economies particularly in small northern forest areas. Jobs provided by tourism based services tend to be more seasonal, short term and lower paying in relation to jobs in manufacturing or forest products industries. The average tourism job earned about \$11,000 per year statewide while the average wood based industry job earned almost \$36,800 per year, with the state average being \$25,000 per year per job.

Social: Increasing demand for forest-based recreation can result in social implications among forest users and within local communities associated with the forests. Within the forests, more users of different types normally results in more frequent user-conflicts among campers seeking rustic versus developed campgrounds and motorized recreation conflicting with non-motorized recreational users. These conflicts challenge public land planning efforts. Within local communities, increased seasonal recreation demands often result in significant changes in community structure and character, required services (fire, police, etc.), property tax values etc.

Comment—Developing Options

B3. Trend/Issue: Demand for forest-based recreation and associated service is increasing.

Please check one:

- ☐ I am interested in this trend/issue and wish to provide comments (*Please go to options below.*)
- ☐ I am NOT interested in this trend/issue and do not wish to respond (*Please go to next page.*)
- ☐ I am interested in this trend/issue BUT I can not comment because (*Please check one.*)
- ☐ Too complex ☐ I need more information ☐ Other _____

Options

Please circle one response for each option.

- A. Providers of forest-based recreation and secondary services should react to the increased demand and changing user groups to meet the new demand.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- B. Comprehensive planning at a regional or local level should work to plan ahead for projected increases and attempt to encourage or discourage various demands that would change the ecological, economic and social conditions in the forest and surrounding area.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- C. New or increasing recreational demands should be discouraged by forest owners and/or local communities through zoning or regulations.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

Suggest changes to existing option(s) or recommend another option(s) and/or general comments about the trend/issue, implications and/or options.

B4. Trend/Issue: Forests are in demand for a mix of uses.

Trend/Issue Definition

The forests of Wisconsin, both public and private, provide a wide array of benefits to the residents of the state and beyond. Generation of forest products, protection of soil and water, habitat for rare species, consumptive and non-consumptive recreation, and wilderness and aesthetic settings are all services that forests can provide. As our population continues to grow the demand for all these services grows as well. The perception of people as to which values can be produced from the same resource base varies widely. For example, most hunters recognize how management for forest products also benefits game species habitat while wilderness advocates often state that both timber harvest and recreational development are incompatible with wilderness experiences. These variables create an increasing challenge for forest managers to provide these diverse services.

Implications

Ecological: Forests are dynamic ecosystems that will change with or without human intervention. As our population increases, a smaller land base of forest will be supporting a growing demand for its services. Decisions regarding which services the forest will support will determine its future ecological condition. Ecological services such as water and soil protection can be provided under a wide array of forest management regimes. Decisions to manage for a forest products emphasis will generally favor a higher percentage of early succession forest types such as aspen and pine and associated wildlife species. Management for wilderness will favor development of a forest of older successional forests such as maple and northern hardwoods and forest interior wildlife species. Forest management for more intensive recreation or residential activities may result in greater fragmentation and associated ecological impacts as well as increasing risk of wildfires.

Economic: Northern Wisconsin communities closely associated with large forest areas depend on the economic benefits of forest product generation and tourism. Regional studies have shown that timber production and recreational use of forests are relatively compatible. Intensive recreation development, motorized use and hunting tend to be more compatible with timber production while silent sport and wilderness uses are less compatible with active forest management. Recreationists require a variety of tourism based services including; lodging, food, fuel and retail stores. Jobs provided by tourism based services tend to be more seasonal, short term and lower paying in relation to jobs in manufacturing or forest products industries. The average tourism job earned almost \$11,000 per year while wood based industries statewide earned almost \$36,800 per year, with the state average across all job types being \$25,000 per year.

Social: The uses of a forest have social implications among forest users and within local communities associated with the forests. The amount and type of forest management will impact recreational users in different ways. Clearcutting benefits game species and hunting opportunities but reduces the aesthetic appeal for many users and conflict with providing a wilderness setting. Increasing motorized recreation trails would attract new users to a forest but may negatively impact hiking or cross-country skiing experiences. Within local communities, the uses of the forest will impact community structure and character, available jobs, required services (fire, police, etc.), and property tax values.

Comment—Developing Options

B4. Trend/Issue: **Forests are in demand for a mix of uses.**

Please check one:

- ☐ I am interested in this trend/issue and wish to provide comments (*Please go to options below.*)
- ☐ I am NOT interested in this trend/issue and do not wish to respond (*Please go to next page.*)
- ☐ I am interested in this trend/issue BUT I can not comment because (*Please check one.*)
- ☐ Too complex ☐ I need more information ☐ Other _____

Options

Please circle one response for each option.

- A. Forest managers and local communities should attempt to maximize the use of forests and respond to any conflicts.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- B. Comprehensive planning at a regional or local level should be undertaken to plan for increasing demands and seek educational and management strategies to maximize compatibility among competing uses.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- C. Forest managers and local communities should seek to limit conflicts by segregating uses into different parts of the forest.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

Suggest changes to existing option(s) or recommend another option(s) and/or general comments about the trend/issue, implications and/or options.

B5. Issue: “Green” accounting is a new way of evaluating forest benefits.

Issue Definition

There are functions and services that a forest provides that are not considered in traditional economic accounting. For example, while most people value clean air and water, there has not been an accepted method of calculating the value of these environmental services provided by forests. The difficulty in accounting for these values can lead to underrating the economic value of forests. Likewise there has not been a way to establish the value of forest aesthetics or other societal values. New research is developing ways to assign value to these aspects of forests (a concept called “green” accounting).

Implications

Ecological: The forest provides a multitude of values beyond the forest products and recreation settings they produce. The nature of a forest as an ecosystem lends itself to wildlife habitat, water purification, water runoff, aesthetics etc. As these are not sold it is difficult to put a value on them. Current best management practices can produce non-market benefits at little cost, however, understanding of these benefits remains limited among people.

Economic: Placing an economic value on the non-market benefits produced by a forest is difficult. Researchers in social economics are trying to develop such valuation methods. A recent effort looked at landowner attitude and the value they placed on the non-consumptive use of their forest in relation to the standing timber value. These non-market benefits generate no economic return to the forest landowner but do provide social benefits both to the landowner and society. In order to maintain non-market values in a market-based economy, a source of income is needed to maintain the forested landscapes required for their provision. Green value accounting has the potential to illustrate the full range of values associated with forests.

Social: Society values clean air, water, scenery and products, but placing a value on anything that is not traditionally sold is difficult. Yet society is asking the managers of the forest resources to place a value on these uses in the planning process. Researchers are trying to develop methods that provide dollar value comparisons among these varied products and benefits. It is important that society appreciate the full range of values derived from forests as they debate policies that can increase or decrease forestland and its sustainable management. One better societal strategy would be to focus on policies which identify the range of values and encourage non-market benefits to be produced at least cost while providing revenue from other activities to support their production.

Comment—Developing Options

B5. Issue: “Green” accounting is a new way of evaluating forest benefits.

Please check one:

- ☐ I am interested in this trend/issue and wish to provide comments (*Please go to options below.*)
- ☐ I am NOT interested in this trend/issue and do not wish to respond (*Please go to next page.*)
- ☐ I am interested in this trend/issue BUT I can not comment because (*Please check one.*)
- ☐ Too complex ☐ I need more information ☐ Other _____

Options

Please circle one response for each option.

- A. Consider the full range of values of forests in planning processes but make no attempt to assign economic value to them.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- B. Use what research has been done to put a value on non-market uses where feasible to use in planning.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- C. Focus research on developing markets for current non-market benefits.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- D. Educate the public and decision-makers regarding the full range of forest values, those with economic value and those without.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

Suggest changes to existing option(s) or recommend another option(s) and/or general comments about the trend/issue, implications and/or options.

B6. Issue: Sustainable management certification is emerging.

Issue Definition:

The forest products economy is a global one. High value veneer timber is likely to be shipped around the world, while wood for lumber and pulpwood is usually processed in the same region in which it grew. An outgrowth of the global marketplace has been the call for “green certification” of forest products. The stamp of certification is meant to assure the buyer that the product came from sustainably managed forestland. There is currently a wide range of certification systems, including Forest Stewardship Council, Sustainable Forestry Initiative, American Tree Farm, and International Standards Organization (ISO) 14001. Several Wisconsin lumber producers are choosing to become certified.

Implications

Ecological: Within each certification process, a suite of sustainable “best management” forestry practices are developed. These forestry practices are to be implemented within the specific ownership that is certified or implemented on the property where raw materials are produced and purchased. The land base being “certified” is increasing under all of these programs. Assuming that these best management practices are either already in place or in time becomes the standard, the variety of ecological benefits will increase proportionally as best management practices are implemented on more acres.

Economic: Conceptually, a driving force behind green certification would be the demand by consumers for green-certified products, with a premium price realized by the producer when a green certified product is available. To date this premium has not developed or is extremely rare. However, research shows that consumers do prefer green certified products vs. non-certified products if the price is the same. Market niche will expand if availability of certified products expands proportionally and the price of these products is competitive. If a trend develops towards certified products, it is possible that the only market for certain products will require green certification. Additional costs for certification fees and the documentation of sustainability are certainly a factor to be evaluated by the interested landowners.

Social: As certification processes continue to expand within the global economy, expectations will rise among consumers that forest management operations be certified. Transparent, third party procedures may be required in order to gain public trust. Competition for market niche may continue between the certification systems.

Comment—Developing Options

B6. Issue: **Sustainable management certification is emerging.**

Please check one:

- ☐ I am interested in this trend/issue and wish to provide comments (*Please go to options below.*)
- ☐ I am NOT interested in this trend/issue and do not wish to respond (*Please go to next page.*)
- ☐ I am interested in this trend/issue BUT I can not comment because (*Please check one.*)
- ☐ Too complex ☐ I need more information ☐ Other _____

Options

Please circle one response for each option.

- A. Allow sustainable certification systems to develop as market demands dictate.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- B. Encourage the development and use of sustainable certification systems.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- C. Seek certification of Wisconsin's designated State Forests. Limit direct involvement to only discreet systems that are most applicable for treatment on state of Wisconsin forestlands.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

Suggest changes to existing option(s) or recommend another option(s) and/or general comments about the trend/issue, implications and/or options.

B7. Trend: Recycling is increasing.

Trend Definition

Recycling of paper and wood products has increased dramatically over the last inventory period. Nationwide, between 1970 and 2000, recycling has increased from under 7% of total waste to about 30% of total waste [EPA, 2000]. In weight, that increase has been even more dramatic, as our waste production has also increased significantly.

Implications

Ecological: In Wisconsin, in 1998, the paper industry used about 2.5 million tons of recycled paper in the production of 5.3 million tons of paper. Paper demand tends to increase proportionally to increases in population. The increases in recycling have decreased the demand for pulpwood for paper by reducing the rate that this demand is growing. Recovered paper now provides more than 37% of the raw material fiber used at U.S. mills, up from 25% in 1988. Recycled fiber has allowed Wisconsin's forest industry to expand while leaving demand for Wisconsin timber relatively stable. Increased recycling has also reduced the amount of paper being landfilled. Recycling can not replace all of the fiber needs of the paper industry, as some new fiber needs to be used in making paper to achieve required strength properties. Recycled fiber can be recycled about 7 times before the fiber breaks down so fine that it is lost from the process.

Economic: The economic impact of recycled fiber has allowed Wisconsin to continue the growth of the paper industry without exceeding the capability of the forest to supply their needs. Growth in this sector has helped keep the state's economy strong. These industries tend to limit the impacts of an economic downturn due to the global nature of their markets. This has also helped to reduce the amount and associated costs of paper products in landfills.

Social: The impact of recycling has been to slow increasing demand for pulpwood for paper products and the benefits of reuse of a resource. The recycling effort is also extending the life of landfills in Wisconsin.

Comment—Developing Options

B7. Trend: **Recycling is increasing.**

Please check one:

- ☐ I am interested in this trend/issue and wish to provide comments (*Please go to options below.*)
- ☐ I am NOT interested in this trend/issue and do not wish to respond (*Please go to next page.*)
- ☐ I am interested in this trend/issue BUT I can not comment because (*Please check one.*)
- ☐ Too complex ☐ I need more information ☐ Other _____

Options

Please circle one response for each option.

- A. Continue to promote recycling in Wisconsin.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- B. Develop recycling systems that increase the separation of paper types.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- C. Encourage research that will allow increases in recycled paper content.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- D. Let the free market drive the amount and type of recycling.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

Suggest changes to existing option(s) or recommend another option(s) and/or general comments about the trend/issue, implications and/or options.

B8. Trend: Efficiency in use of wood has increased.

Trend Definition

With improved technology for harvesting and milling, processing wood is now more efficient. More of the tree can be utilized at each step of the process, and new markets are being developed for wastes, such as saw dust, that once were discarded

Implications

Ecological: More efficient use of wood reduces the acreage of forestland needed to produce a given amount of wood. Technology in the processing of wood has been evolving to fit the ever-changing forest resource and society. Limited labor availability has driven the trend toward greater automation. Resource changes to smaller timber with more defects, that in the past were not utilized and subject to natural mortality, and global competition have driven the development of advanced processing equipment. This global competition includes competition with firms located in countries with labor costs a fraction of what the costs are here and less restrictive environmental regulation. Example technologies include thinner kerf sawing, computer optimization, computer controlled drying, self-leveling logging equipment, low ground compression equipment, etc. and pulping technologies that cause less air and water pollution and are more efficient and flexible. Environmental concerns and restrictions have also driven these investments.

Economic: The use of automated technology allows for more consistent decision-making resulting in better quality. These technologies also require less labor to operate. The reduction in the thickness of the saw can result in 1 to 3% more lumber recovery for every 1/32-inch the thickness of the saw is reduced. The high cost of the new technology has increased the competitiveness among large firms that can afford the technology and in doing so a consolidation of the industry to fewer firms has been occurring.

Social: The trend towards more efficient technology has reduced the number of smaller firms that exist. Some of the small family operations with fewer financial resources have closed, not being able to compete. More forest industry jobs are highly technical and provide a higher wage for the worker. The improved technology has allowed Wisconsin forests to support a growing forest industry with significant benefits to citizens in the form of jobs and recreational opportunities.

Comment—Developing Options

B8. Trend: **Efficiency in use of wood has increased.**

Please check one:

- ☐ I am interested in this trend/issue and wish to provide comments (*Please go to options below.*)
- ☐ I am NOT interested in this trend/issue and do not wish to respond (*Please go to next page.*)
- ☐ I am interested in this trend/issue BUT I can not comment because (*Please check one.*)
- ☐ Too complex ☐ I need more information ☐ Other _____

Options

Please circle one response for each option.

- A. Foster technology transfer in the wood industry to increase efficient use of wood and maintain the competitive strength of Wisconsin industries.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- B. Allow the global market to determine where wood is cut and how efficiently it is processed.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

Suggest changes to existing option(s) or recommend another option(s) and/or general comments about the trend/issue, implications and/or options.

C1. Trend/Issue: Large blocks of industrial forests are changing hands rapidly.

Trend Definition

In recent years we have seen an increase in transfer of large blocks of forested lands between industrial companies, and in some notable cases, out of industrial ownership and into government or non-industrial private ownership. This trend may have important ecological, economic, and social implications for the future as these large forested land holdings are divided and, potentially, converted from forested lands to other land uses.

Implications

Ecological: The large blocks of industrial forest lands, totaling in excess of one million acres in Wisconsin, provide important ecological benefits. They, together with adjacent public lands, provide contiguous blocks of forested habitat for a wide range of species. These lands also purify our water and sequester carbon. As this land is subdivided, development (and by extension, fragmentation) increases.

Economic: The industrial land base is an asset that encourages maintaining forest industry within Wisconsin. The forest products industry is the state's second largest, and Wisconsin leads the nation in paper production, value of shipments, and wages within the forest products sector. The industrial lands provide an important land base for a range of recreational activities, including hunting and snowmobiling, which contribute significantly to the local economy in the adjacent areas.

Social: The amount of land open for public use is declining statewide, at the same time that demand for forest-based recreation is increasing. Almost all of the industrial lands are open to public use for a range of recreational activities, contributing to the quality of life in the areas within which these lands are located. Furthermore, the vast tracks of undeveloped land contribute to the rural character that attracts many to live, work and recreate in Northern and Central Wisconsin.

Comment—Developing Options

C1. Trend/Issue: **Large blocks of industrial forests are changing hands rapidly.**

Please check one:

- ☐ I am interested in this trend/issue and wish to provide comments (*Please go to options below.*)
- ☐ I am NOT interested in this trend/issue and do not wish to respond (*Please go to next page.*)
- ☐ I am interested in this trend/issue BUT I can not comment because (*Please check one.*)
- ☐ Too complex ☐ I need more information ☐ Other _____

Options

Please circle one response for each option.

- A. Status Quo—Allow market forces to dictate the disposition of these lands. A percentage of these lands are very likely to come out of industrial ownership and are likely to be subdivided and closed to public use. It is not clear how much of this will occur over the next 10 to 20 years, but the percentage could be quite high.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- B. Purchase of Development & Access Rights—The public and/or private conservation organizations can pursue acquisition of rights to land that have particular public benefit. For example, if the public desires to see these large blocks of land maintained in an undeveloped state with access by the public, the state or another entity can seek to purchase those rights from willing sellers. In 2000, Wisconsin entered the federal Forest Legacy program, which is geared toward maintaining large blocks of sustainably-managed forest lands. This program provides funds that can be used to help accomplish this objective.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- C. Acquisition of Land—The public and/or private conservation organization can pursue acquiring fee title to large blocks of forest lands to ensure they continue to provide the values desired by the public. All rights would be acquired through this option, though the amount of land that could be acquired with a particular sum of money would be significantly lower than under Option 2.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

Suggest changes to existing option(s) or recommend another option(s) and/or general comments about the trend/issue, implications and/or options.

C2 Trend: More people are purchasing forested lands.

Trend Definition

The number of non-industrial private owners of forested land is up due to division of tracts into smaller parcels. Tract sizes across the Lake States are diminishing, fueled in part by the value of forested land for recreational uses and home sites. Forest surveys estimate that the number of Wisconsin forest owners (about 270,000 in 1997) has approximately doubled over the last forty years. Parcelization of forests results in fragmentation—more roads, homes, yards, paths, etc.

Implications

Ecological:

- Increased human impacts, including spreading of exotic or invasive species
- Structural alterations in habitat such as creation of more edge
- Altered climatic conditions
- Increased runoff and soil erosion, resulting in a loss of water quality
- Loss of forest interior species that fall prey to or are displaced by edge dwellers
- Isolation of species unable or unwilling to cross barriers
- Potential increases in wildlife diseases, including those that can be transmitted to humans

Economic:

- Inflation of land prices
- Rising property taxes
- More expensive to provide public services to a dispersed population
- Reduced economies of scale making small tracts of timber impractical to manage
- Declining supplies of forest products needed by society
- Local jobs based on the production of forest commodities may become threatened

Social:

- Reduced scenic beauty
- Benefits for individual owners of forested parcels
- Loss of recreational opportunities as more land is posted no trespassing
- An increase in non-resident landowners (with different values) affects local political institutions and decisions

Comment—Developing Options

C2 Trend: **More people are purchasing forested lands.**

Please check one:

- ☐ I am interested in this trend/issue and wish to provide comments (*Please go to options below.*)
- ☐ I am NOT interested in this trend/issue and do not wish to respond (*Please go to next page.*)
- ☐ I am interested in this trend/issue BUT I can not comment because (*Please check one.*)
- ☐ Too complex ☐ I need more information ☐ Other _____

Options

Please circle one response for each option.

- A. Do nothing; allow market prices to dictate size of forest parcels.
- | | | | |
|-------|-----------------------------|--------|--|
| 1 | 2 | 3 | 4 |
| Favor | Neither favor
nor oppose | Oppose | I don't understand,
need more information |
- B. Encourage Smart Growth through land use planning, zoning designations and development guidelines.
- | | | | |
|-------|-----------------------------|--------|--|
| 1 | 2 | 3 | 4 |
| Favor | Neither favor
nor oppose | Oppose | I don't understand,
need more information |
- C. Create tax penalties for splitting land.
- | | | | |
|-------|-----------------------------|--------|--|
| 1 | 2 | 3 | 4 |
| Favor | Neither favor
nor oppose | Oppose | I don't understand,
need more information |
- D. Develop use value assessment for forestland similar to the program now established for agricultural land in Wisconsin. Base forest property taxes on current use rather than best use.
- | | | | |
|-------|-----------------------------|--------|--|
| 1 | 2 | 3 | 4 |
| Favor | Neither favor
nor oppose | Oppose | I don't understand,
need more information |
- E. Provide compensation to forest landowners for the production of non-market goods like carbon sequestration, wildlife habitat, protection of water quality, etc. Providing compensation for non-market goods could reduce the pressure to generate income by parcelization.
- | | | | |
|-------|-----------------------------|--------|--|
| 1 | 2 | 3 | 4 |
| Favor | Neither favor
nor oppose | Oppose | I don't understand,
need more information |
- F. Educate landowners about the consequences of land parcelization and the benefits of working forests.
- | | | | |
|-------|-----------------------------|--------|--|
| 1 | 2 | 3 | 4 |
| Favor | Neither favor
nor oppose | Oppose | I don't understand,
need more information |
- G. Purchase conservation easements or development rights to protect natural landscapes.
- | | | | |
|-------|-----------------------------|--------|--|
| 1 | 2 | 3 | 4 |
| Favor | Neither favor
nor oppose | Oppose | I don't understand,
need more information |

- H. Foster associations where landowners can cooperate, consider the landscape implications of management decisions, or join together to regain some economies of scale for management activities.

1
Favor

2
**Neither favor
nor oppose**

3
Oppose

4
**I don't understand,
need more information**

Suggest changes to existing option(s) or recommend another option(s) and/or general comments about the trend/issue, implications and/or options.

→ *Go to next page*

C3. Issue: More private forestry assistance is needed.

Issue Definition

As the number of non-industrial private forest landowners increases, providing professional forestry guidance to them becomes more difficult. Surveys estimate that only about 18% of landowners utilize assistance from professional foresters prior to harvesting timber and that 80% of woodland owners do not have a written forest management plan for their property. With over ten million acres of non-industrial, private forests in Wisconsin, the proper management of that land is critical to sustaining the resource for the many public benefits that come from it.

Implication

In the absence of professional guidance:

Ecological:

- Destructive cutting practices may reduce the ability of the forest to renew itself
- Wildlife habitat, endangered or threatened plants and animals, clean water and other environmental elements essential to a healthy ecosystem may be injured or left unimproved
- Forest pests including insects and diseases are more likely to go uncontrolled and cause more damage
- Land will recover more slowly from catastrophes such as wind storms or fires without a sufficient number of foresters to provide assistance to landowners
- Lands retired from agricultural uses are less likely to be reforested or established in alternative natural vegetative cover
- Opportunities to improve grasslands and wetlands associated with forested landscapes will be missed

Economic:

- The long-term productivity of land for both commercial and non-commodity benefits will be reduced
- Landowners harvesting timber are less likely to receive the high returns for their products without professional forestry assistance
- The supply of commercial forest products will decline, causing shortages and higher prices
- Fewer landowners will benefit from forest tax or cost-sharing incentives if foresters are not available to administer the programs

Social:

- Landowners become frustrated if they cannot get professional resource management advice within a reasonable time
- Without advice, some landowners become hesitant to make any resource management decisions, others will jump to inappropriate choices
- Recreational and aesthetic potentials of the landscape will not be realized or protected
- Fewer landowners would be able to enjoy or appreciate the ecological significance of their property without the help of professional resource managers

Comment—Developing Options

C3. Issue: **More private forestry assistance is needed.**

Please check one:

- ☐ I am interested in this trend/issue and wish to provide comments (*Please go to options below.*)
- ☐ I am NOT interested in this trend/issue and do not wish to respond (*Please go to next page.*)
- ☐ I am interested in this trend/issue BUT I can not comment because (*Please check one.*)
- ☐ Too complex ☐ I need more information ☐ Other _____

Options

Please circle one response for each option.

- A. Wait for the marketplace to provide forestry assistance to the extent that landowners are willing to pay for professional services.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- B. Advocate an increase in the number of public and private professional foresters in Wisconsin available to work with landowners and trained to address the wide array of landowner interests. Assure that private forestry assistance resources (including public institutions, private enterprises and private groups) work together effectively and efficiently.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- C. Educate landowners about the value of hiring private consulting foresters and other professional resources managers in private enterprise. Offer cost-sharing assistance to landowners that hire private foresters.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- D. Require landowners to hire private foresters to prepare forestry plans and/or conduct forest management activities.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- E. Empower local communities of forest stewards. Foster local landowner associations, wood cooperatives or trusts where landowners can help one another or band together to hire forestry assistance.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- G. Enact mandatory forest practices laws that would require landowners to implement sound harvest and reforestation techniques using professional assistance.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

Suggest changes to existing option(s) or recommend another option(s) and/or general comments about the trend/issue, implications and/or options.

→ *Go to next page*

C4. Trend: **Demographics of forest landowners are changing.**

Trend Definition

Today, forested parcels are likely to be purchased by people whose values differ from forest owners in the past. For example, forest surveys show that woodland owned by Wisconsin farmers declined from 6,372,000 acres in 1956 to only 1,467,750 acres in 1997. Rather than managing forests to supplement farm income, many current woodland owners are from urban areas and own forestland primarily for recreational or aesthetic values. Many tend to be hesitant about harvesting timber (especially using even-age techniques) or active management for any purpose. Others, however, are willing to implement practices that further their goals when they are persuaded through educational efforts.

Implication

Ecological

- Forest types (such as aspen, jack pine and oak stands) that require disturbances for perpetuation are likely to convert to shade tolerant species.
- Forest stands will tend to be older and more crowded, with a risk of reduced growth rates and a greater incidence of age-related pests.
- Wildlife (such as ruffed grouse) that depends on young forests will become less common.
- Conifer plantations, which require periodic thinning to maintain health, may become neglected and decline if owners do not have an interest in active management.

Economic

- Forest industries that depend on even-age forest types might experience a shortage of raw materials.
- Forests located in popular recreation destinations may decline in production of commercial products.
- Urban landowners tend to inflate the value of woodland.
- Land ownership tenure might be shorter, with more frequent transfers, if property is not held for an income-related purpose more common in farming.

Social

- The new landowners may not fit well into the fabric of rural communities, being unfamiliar with local institutions and less concerned about the needs of their neighbors.
- Local resident landowners may be forced into seeking new types of employment if traditional farming and timber economies change.
- Conflicts (such as complaints about farming odors or timber cutting) may arise between long-time resident landowners and the newer or non-resident types.
- Local institutions that depend on volunteers from the community (such as fire departments and local governments) may experience staffing problems if the percentage of resident property owners declines.

Comment—Developing Options

C4. Trend: **Demographics of forest landowners are changing.**

Please check one:

- ☐ I am interested in this trend/issue and wish to provide comments (*Please go to options below.*)
- ☐ I am NOT interested in this trend/issue and do not wish to respond (*Please go to next page.*)
- ☐ I am interested in this trend/issue BUT I can not comment because (*Please check one.*)
- ☐ Too complex ☐ I need more information ☐ Other _____

Options

Please circle one response for each option.

- A. Wait for land ownership patterns to take shape as they may, without specific activities to artificially influence markets or attitudes.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- B. Strengthen and update Wisconsin's private landowner assistance network. Advocate an increase in the number of professional foresters in Wisconsin available to work with landowners and trained to address the wide array of landowner interests. Add public forester positions and provide incentives to help landowners hire private consulting foresters. Foster local landowner communities through associations, trusts or wood cooperatives where landowners can gain confidence in forest management through interaction with their neighbors.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- C. Develop outreach tools with which to reach a larger percentage of landowners who own forest-land. Use these tools to raise awareness about forests and sustainable forestry. Assist UW Extension, Wisconsin Woodland Owners Association and other agencies and groups to promote landowner education. Provide landowner education opportunities through field tours, conferences and news releases.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- D. Seek to make the practice of sustainable forestry more profitable through tax incentives, cost sharing programs and the development of markets for certified forest products.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- E. Enact mandatory forest practices laws that would require landowners to implement sound harvest and reforestation techniques

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

Suggest changes to existing option(s) or recommend another option(s) and/or general comments about the trend/issue, implications and/or options.

→ *Go to next page*

C5: Trend/Issue: **Less forest land is available for public use.**

Trend/Issue Definition

With changes in ownership of industrial lands and demographic changes in non-industrial private land owners, the amount of forested land open for public use is decreasing. This trend has implications for the future of public hunting, fishing and other forms of recreation.

Implications

Ecological

- Increased density of roads, buildings and overall changes in private land use stemming from the increased number of landowners and smaller parcel sizes leads to permanent fragmentation. Wildlife habitat and species composition are impacted. Interior-dependent songbird species will become more concentrated and dependent on public land blocks.
- Higher concentrations of game species on private lands. Quota-setting and management of game species may become more problematic.
- Increased hunting pressure on public lands could negatively impact some species.
- Potential for increased erosion and ecological damage on public land as motorized recreation becomes more prevalent.
- Conflicts between the ever-increasing recreational users and timber harvesting will most likely lead to less even-aged management along recreational corridors.
- Seasonal recreation use can limit timber harvest opportunities, directly influencing regeneration potential for some species.

Economic

- More staff and bigger budgets for public land will be needed to address the increased usage.
- Traditional timber harvesting income may decrease as the public land blocks are used more heavily for recreation and user conflicts with logging increase. Land managers will be challenged to provide opportunities for a greater number of users, for a wider variety of uses, in the same amount of space.

Social

- Increased pressure on public lands may lead to degraded recreational experiences for some user groups. (e.g. hunting, fishing, hiking, skiing)
- Conflicts among user groups can be expected to increase.
- Trespass problems can be expected to increase. Most new landowners post their property against trespassers. Public hunting on industrial forest land has gone on for many years and parcelization of these larger tracts (and consequent posting) interrupts historical hunting patterns.
- Parcelization of industrial forest lands has proven to break continuity in recreational trails. This could lead to the need for additional trails on public land to maintain connectivity.
- Increased conflict and controversy on land management activities such as timber harvesting.

Comment—Developing Options

C5: Trend/Issue: **Less forest land is available for public use**

Please check one:

- ☐ I am interested in this trend/issue and wish to provide comments (*Please go to options below.*)
- ☐ I am NOT interested in this trend/issue and do not wish to respond (*Please go to next page.*)
- ☐ I am interested in this trend/issue BUT I can not comment because (*Please check one.*)
- ☐ Too complex ☐ I need more information ☐ Other _____

Options

Please circle one response for each option.

- A. Allow the trend to continue at its own pace.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- B. Restructure the Managed Forest Law program to provide additional incentives to landowners who keep their land open to the public.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- C. Promote the increased purchase of public lands

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- D. Offer incentive programs (e.g. tax benefits) that encourage larger landowners not to partition their property. Provide a program whereby non-tax law landowners are offered an incentive if they keep their land open to the public.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- E. Purchase public hunting and fishing easements on private land.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

Suggest changes to existing option(s) or recommend another option(s) and/or general comments about the trend/issue, implications and/or options.

C6. Trend/Issue: Stakeholders are more involved in forest decisions.

Trend Definition

For a number of reasons, there is increased participation by a variety of stakeholders in decisions affecting forest policy and management of public lands. Various levels of government, local community groups, concerned industry groups, recreational users, property owners, and environmental groups are often a part of major decisions affecting Wisconsin's forests.

Implications

Ecological: Stakeholders often bring information to discussions about issues. In some cases, this information pertains to the ecological aspects of the decision. This information helps inform the discussion and can influence decisions made.

Economic: Many stakeholders are impacted directly or indirectly by the economic ramifications of decisions about the forest resource. Information about these implications often are not as readily available as, say, ecological information. However, stakeholder involvement does ensure that economic aspects of sustainability are taken into account in decision making.

Social: By definition, stakeholders are in the best position to articulate many of the social implications of decisions about forests. Stakeholders reflect the range of values associated with our forests and decisions are improved by interactions among various stakeholders. Increased involvement in decisions about forests also increases the awareness and understanding of the public and other interest groups with respect to the full range of interests associated with forests. However, some stakeholders have expressed concern that there are too many issues for which public dialogue is desired, making it difficult for those who care about forests to adequately participate in such processes. In addition, processes take resources and time, both from participants and sponsoring agencies or groups.

Comment—Developing Options

C6. Trend/Issue: **Stakeholders are more involved in forest decisions.**

Please check one:

- ☐ I am interested in this trend/issue and wish to provide comments (*Please go to options below.*)
- ☐ I am NOT interested in this trend/issue and do not wish to respond (*Please go to next page.*)
- ☐ I am interested in this trend/issue BUT I can not comment because (*Please check one.*)
- ☐ Too complex ☐ I need more information ☐ Other _____

Options

Please circle one response for each option.

- A. Continue to promote increased public dialogue about forestry issues.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- B. More carefully assess the relative benefits and costs associated with the level of stakeholder involvement in specific issues. Target specific processes for specific issues to maximize the value of dialogue without overextending those who wish to be involved in decisions affecting our forests.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- C. Allow resource managers to make more of the decisions about protecting and managing forests without extensive stakeholder involvement.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

Suggest changes to existing option(s) or recommend another option(s) and/or general comments about the trend/issue, implications and/or options.

C7. Trend/Issue: **Conflicting use of forests is a public debate.**

Trend/Issue Definition

Forests are used for recreation, to provide aesthetic beauty, to produce forest products, to maintain water quality, and to preserve wildlife habitat, among many other uses. Not all of these uses are always compatible in the same forest. The debate among people who value the forest for different reasons has grown in recent years. Some forest uses and some forest management techniques are controversial. This debate will continue to inform management decisions made in Wisconsin's communities.

Implications

Ecological: Controversial management practices may be used more sparingly, affecting the long-term composition of Wisconsin forests. Reducing the use of even-aged management techniques such as clearcutting and shelterwood harvesting will, in the long-run, reduce the percentage of early and mid-successional forest types such as aspen, paper birch, jack pine, red pine, white pine, red oak and white oak. Increases will be seen in later successional (shade tolerant) forest types such as northern hardwoods; however, the species diversity within these types may be reduced if the techniques that bring more sunlight into the forest canopy are not used to some degree.

Economic: Both forest products and forest-based recreation contribute significantly to local economies and the state's economy. To the extent that they are compatible, promoting both can maximize the economic benefits. However, the extent to which uses are incompatible—be they different types of recreational activities or recreation and forest management—limits to some extent where and how extensive economic benefits from the forests can be realized.

Social: Conflict among users with different interests and values can create discord in communities and hamper decision-making. Desires to limit overlapping uses may be desirable and, in some cases, necessary; however, the result is that there are fewer areas overall available for these different uses.

Comment—Developing Options

C7. Trend/Issue: **Conflicting use of forests is a public debate.**

Please check one:

- ☐ I am interested in this trend/issue and wish to provide comments (*Please go to options below.*)
- ☐ I am NOT interested in this trend/issue and do not wish to respond (*Please go to next page.*)
- ☐ I am interested in this trend/issue BUT I can not comment because (*Please check one.*)
- ☐ Too complex ☐ I need more information ☐ Other _____

Options

Please circle one response for each option.

- A. Assess and develop guidelines that address the compatibility of various recreational activities with one another and with the range of forest management activities.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- B. Foster public dialogue locally and/or statewide with respect to the compatibility of various recreational activities with one another and with the range of forest management activities. This can be accomplished with a focus on individual properties (public lands) or from a statewide perspective.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- C. Promote dominant use of various areas within public forests, separating recreational users from one another and from certain forest management activities.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

Suggest changes to existing option(s) or recommend another option(s) and/or general comments about the trend/issue, implications and/or options.

C8. Issue: Clearcutting and even-age management techniques are controversial.

Issue Definition

Clearcutting is a timber harvesting process and a stand regeneration method that removes all trees from an area at the same time. This method typically encourages the regeneration and management of earlier successional species in forest types that have a uniform age. This even-age management technique, along with other techniques (such as seed tree and shelterwood regeneration methods), create aesthetic and ecological changes to a forest. A variety of forest values (including aesthetic and ecological) benefit from this activity, while at the same time a variety of values are negatively affected. The trade-offs typically polarize advocates for specific forest values. Forest types that are favored with these techniques are pioneer to mid-successional types. Other disturbances (such as fire), either natural or human caused, could be used to maintain these types. Fire has historically been suppressed or not used in forest management prescriptions due to public health and safety concerns or the lack of technical experience and resources. The use of even-age techniques and other disturbance oriented management tools (like prescribed fire) will continue to be an issue of conflict.

Implications

Terms like clearcut, even-aged management, selection system, and uneven-aged management often have different meanings to different people. Technical definitions can be confusing, misinterpreted, or considered irrelevant jargon. Lack of clarity or understanding of terms can result in increased conflict.

Ecological: Ecological implications of even-aged management are complex. Positive and negative impacts can occur at stand, landscape and regional levels. Conflicts arising from even-aged management often result from stand level activities and reactions to change (particularly the changed appearance of a recently harvested stand). However, ecological impacts are most significant at broader spatial scales—a result of cumulative effects of stand level activities.

Early to mid-successional forest tree species and cover types are adapted to disturbance and require it to regenerate. Fire historically was an important agent causing disturbances ranging from light and small to intense and large. Characteristics of other agents of disturbance have also changed, including insects, disease, animals, wind, and ice. New disturbance factors have been incorporated into the forest ecosystem, including climate change, pollution, exotic pests, land use conversion, human recreation, and logging. Disturbance regimes (type, timing, and intensity) have changed significantly in recent history. As a result, relative abundance and distributions of forest cover types and successional stages have changed significantly, impacting other plants and animals that are part of these systems.

Economic: Even-aged management is an efficient and cost-effective system to regenerate, to maximize growth, vigor, and quality of, and to harvest most forest cover types. Uneven-aged management of early to mid successional cover types often will result in eventual type conversion, stand growth and vigor will be reduced, timber quality could be reduced, and operational logistics could be inefficient. Where maintenance of early to mid-successional species is an objective, even-aged management generally will be the most cost-effective means, and can provide the highest economic returns. For many people, even-aged management temporarily decreases the aesthetic quality of the forest. However, this has not been shown to reduce forest-based recreation and tourism. Frequently, even-aged management supports larger populations of popular game species, which does have a positive impact on recreation and tourism.

Social: Even-aged management usually results in a dramatic change in the character of a forest stand that many people see as a significant decrease in aesthetic quality. Immediate reactions can be fierce, especially when impacted stands are located in areas of personal significance. Often, these concerns are abated as the forest regenerates and young trees gain height. As a result of the dramatic change following even-aged harvests, misinterpretations of ecological impacts are common. Negative ecological impacts, like deforestation or destruction of wildlife and biodiversity, may be automatically and erroneously assumed. The ecological and economic impacts of even-aged management often are not understood.

Comment—Developing Options

C8. Issue: **Clearcutting and even-age management techniques are controversial.**

Please check one:

- ☐ I am interested in this trend/issue and wish to provide comments (*Please go to options below.*)
- ☐ I am NOT interested in this trend/issue and do not wish to respond (*Please go to next page.*)
- ☐ I am interested in this trend/issue BUT I can not comment because (*Please check one.*)
- ☐ Too complex ☐ I need more information ☐ Other _____

Options

Please circle one response for each option.

- A. Discourage the use of even-aged management to the greatest extent possible
- | | | | |
|-------|-----------------------------|--------|--|
| 1 | 2 | 3 | 4 |
| Favor | Neither favor
nor oppose | Oppose | I don't understand,
need more information |
- B. Encourage the use of even-aged management to the greatest extent possible
- | | | | |
|-------|-----------------------------|--------|--|
| 1 | 2 | 3 | 4 |
| Favor | Neither favor
nor oppose | Oppose | I don't understand,
need more information |
- C. Encourage the use of both even-aged and uneven-aged management within the largest variety of forest types and patch sizes possible.
- | | | | |
|-------|-----------------------------|--------|--|
| 1 | 2 | 3 | 4 |
| Favor | Neither favor
nor oppose | Oppose | I don't understand,
need more information |
- D. Develop collaborative landscape level goals that utilize a mix of even-and uneven aged management to achieve specific benefits while maintaining adverse effects.
- | | | | |
|-------|-----------------------------|--------|--|
| 1 | 2 | 3 | 4 |
| Favor | Neither favor
nor oppose | Oppose | I don't understand,
need more information |

Suggest changes to existing option(s) or recommend another option(s) and/or general comments about the trend/issue, implications and/or options.

C9. Issue: Role of Public Forests

Issue Definition

As our growing populace places more extensive and diverse demands on our forests, the conflict is most acutely felt on the public forests. The federal, state, county and local forests have, to varying degrees, been subject to increasing conflicts between various interests and among various users. The role of public forests at different scales needs to be more clearly defined, and the implications of possible decisions made clear.

Implications

Interest and use by the public of our public forests is primarily for recreation. Collective groups/organizations of taxpayers and municipal officials view the forest for its financial return values or lack of them. Land managers are often caught in the middle of producing forest products, maintaining wildlife habitat, protecting water quality and trying to satisfy the ever-increasing recreational demands. Managing conflicts between timber harvesting and recreational use is a primary issue facing public land managers. Conflicts between various recreational users are present as well.

Ecological

- Aesthetic & recreation-based viewpoints of our public forests discourage even-aged harvests. This is leading to a decrease in intolerant types such as aspen, birch and jack pine.
- Increase in all-aged, later successional species such as maple—basswood.
- Soil erosion concerns on motorized use areas
- Uses such as wilderness preservation preclude use by other user groups.
- Management for larger areas of old growth forests will increase in response to aesthetic and ecological concerns.
- Seasonal recreation use can limit timber harvests opportunities, directly influencing regeneration potential of some species.

Economic

- Reacting to public demands will lead to less timber cutting and consequently less timber income.
- May not be able to satisfy the increasing demands of society for forest products with current/increased acreage of public forest off limits to harvesting.
- Potential shift in local economies from forest product-based economy to more recreation / tourism- based economy.

Social

- Need & expectation for more trails and the increased numbers of participants will degrade the experience for some groups. Accommodating what are now some of the more minor recreational uses (horseback riding, snowshoeing, mountain biking) will enrich their respective sports.
- Decreasing harvest levels will have a short-term negative impact on the local citizens.

Comment—Developing Options

C9. Issue: **Role of Public Forests**

Please check one:

- ☐ I am interested in this trend/issue and wish to provide comments (*Please go to options below.*)
- ☐ I am NOT interested in this trend/issue and do not wish to respond (*Please go to next page.*)
- ☐ I am interested in this trend/issue BUT I can not comment because (*Please check one.*)
- ☐ Too complex ☐ I need more information ☐ Other _____

Options

Please circle one response for each option.

- A. Make timber production the primary focus of public forest land.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- B. Manage public forests primarily for recreational uses.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- C. Manage public forests primarily to maximize biological diversity.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- D. Manage for/accommodate all uses on all public forests.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- E. Create goal specific blocks of public forests and manage these blocks for compatible uses.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

Suggest changes to existing option(s) or recommend another option(s) and/or general comments about the trend/issue, implications and/or options.

C10. Trend/Issue: Motorized recreation is becoming more popular.

Trend/Issue Definition

Public and private forests provide for a wide variety of recreational activities including the use of snowmobiles, All Terrain Vehicles (ATVs), 4 wheel drive trucks and dirt bikes. The number of motorized users in Wisconsin has increased dramatically in the last decade. For example, snowmobile registration has risen from 155,000 machines in 1991 to 257,000 in 2000 while ATV registration has risen from 60,000 in 1991 to 126,000 in 2000. Motorized users move faster, travel longer distances and require more land for their recreation than nonmotorized users. Issues resulting from this increase in numbers include; insufficient trail opportunities, safety, greater law enforcement and land maintenance costs, conflicts with non-motorized users, and various environmental impacts (soil erosion, plant disturbance, etc.). Motorized users have also been shown to spend more money than most other recreationists and are viewed by some communities as an economic asset. Some large forest landowners are showing a trend toward restricting or eliminating motorized recreation opportunities.

Implications

Ecological: Motorized recreation can take a variety of forms including winter or summer, trail-based, off-trail or cross-country travel, utility travel for another activity such as hunting, and intensive use or play areas. These different use types have varying potential ecological impacts including soil erosion, plant and wildlife disturbance, transport of non-native invasive species, noise and exhaust emissions. Depending on the design and level of use, winter trail based motorized recreation tends to have the least ecological impact. If motorized recreation continues to increase these negative ecological impacts will be expected. These impacts can be minimized through proper trail planning, user education, increased law enforcement, increased maintenance and decreased densities on any given location.

Economic: Many northern Wisconsin communities have recognized motorized recreation as a significant positive economic factor, particularly with national recognition of snowmobiling in Wisconsin. Some view motorized recreation as an opportunity to diversify local economies with new users who will spend money on services such as restaurants and motels. In areas where economies may be strongly based on the existing non-motorized recreational users, increasing motorized recreation may result in a decrease in the attraction to other users. Motorized users tend to spend more on their recreation than other outdoor users but have lower spending near their recreation site than other users. This is likely due to the high cost of their machines that are often purchased close to the user's place of residence.

Social: Proposals to introduce motorized recreation into new areas or increase existing levels have consistently created conflicts with existing land uses. Established users fear that the noise and potential ecological impacts of increased motorized recreation will negatively impact their recreation. Landowners adjacent to lands with motorized recreation also express concern over noise impacts. Some public and private land managers have expressed concern over impacts of motorized travel on their lands. Many motorized trails cross multiple ownerships creating a complex series of land use agreements required to support the trail. Generally, landowners are more willing to agree to winter use than summer use trails across farms or rural forest land.

Comment—Developing Options

C10. Trend/Issue: **Motorized Recreation is becoming more popular**

Please check one:

- ☐ I am interested in this trend/issue and wish to provide comments (*Please go to options below.*)
- ☐ I am NOT interested in this trend/issue and do not wish to respond (*Please go to next page.*)
- ☐ I am interested in this trend/issue BUT I can not comment because (*Please check one.*)
- ☐ Too complex ☐ I need more information ☐ Other _____

Options

Please circle one response for each option.

- A. Respond to the increasing number of motorized users by opening new forest lands to motorized recreation and creating new trail and intensive use area opportunities.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- B. Through comprehensive planning look at the positive and negative implications of increased motorized recreation and plan for areas with and without motorized recreation

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- C. Restrict areas open to motorized recreation to avoid potential negative impacts to land resources or other forest recreationists.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

Suggest changes to existing option(s) or recommend another option(s) and/or general comments about the trend/issue, implications and/or options.

C11. Trend/Issue: More trails are being created and used.

Trend/Issue Definition

The demand for trail based recreation throughout Wisconsin continues to increase resulting in more trails on the landscape, a greater diversity of trail based activities and more frequent user conflicts. New or increasing trail uses result in demands for single use trails to become multi-use trails or for new trail development. Creation of new trails requires more land base, more cost for trail development and maintenance, and a greater need for cooperative planning among forest landowners. In some areas trail opportunities are increasing through programs such as rails to trails. In other areas, opportunities are decreasing, for example, when large private forest landowners sell off portions of their land base to multiple small owners.

Implications

Ecological: Increased trail use and development will result in more people causing more impact to the forests they have come to experience. Different use types have varying potential ecological impacts including soil erosion, plant and wildlife disturbance, transport of non-native invasive species, noise and exhaust emissions. Examples of potential ecological impacts from different use types are varied; from erosion concerns on mountain bike or ATV trails to spread of invasive plant seeds by horses and from disturbance of wildlife by hikers to clearing for mechanized grooming of cross country ski trails. These impacts can be minimized through proper trail planning, user education, increased law enforcement, increased maintenance and decreased densities on any given location. Greater appreciation for ecological values through experiencing natural settings on a trail may result in long-term ecological benefits.

Economic: Economic impacts from increased trail-based recreation can be local or statewide in scale. In local communities trail users require a variety of tourism-based services including; lodging, food, fuel and retail stores. This increased service demand can help diversify local economies particularly in small northern forest areas. Jobs provided by tourism based services tend to be more seasonal, short term and lower paying compared with jobs in manufacturing or forest products industries. On a statewide scale, the increased demand for recreational products can have an economic impact through sales of items such as ATVs or mountain bikes. Motorized users tend to spend more on their recreation than other outdoor users but have lower spending near their recreation site than other users.

Social: Increasing demand for trail-based recreation can result in social implications among forest users and within local communities associated with the forests. On the trails, more users of different types often results in more frequent conflicts among users. Very contentious issues arise when proposing new uses on an existing trail or a new trail that may change the character of a forest property. Examples of conflicts include motorized trail activities versus silent trail use or mountain bikes and horses sharing a trail. Some regional trails cross multiple ownerships, creating a complex series of land use agreements required to support the trail.

Comment—Developing Options

C11. Trend/Issue: **More trails are being created and used**

Please check one:

- ☐ I am interested in this trend/issue and wish to provide comments (*Please go to options below.*)
- ☐ I am NOT interested in this trend/issue and do not wish to respond (*Please go to next page.*)
- ☐ I am interested in this trend/issue BUT I can not comment because (*Please check one.*)
- ☐ Too complex ☐ I need more information ☐ Other _____

Options

Please circle one response for each option.

- A. Forest managers and communities can react to new trail-use demands as they develop and provide accommodations for these users.
- | | | | |
|-------|-----------------------------|--------|--|
| 1 | 2 | 3 | 4 |
| Favor | Neither favor
nor oppose | Oppose | I don't understand,
need more information |
- B. Through comprehensive planning, communities and forest managers can work together to decide what types of trail-based recreation they will encourage and how to incorporate these new uses into forest management and community goals.
- | | | | |
|-------|-----------------------------|--------|--|
| 1 | 2 | 3 | 4 |
| Favor | Neither favor
nor oppose | Oppose | I don't understand,
need more information |
- C. Forest managers and communities can limit types or increases in trail based recreation through property regulations or zoning.
- | | | | |
|-------|-----------------------------|--------|--|
| 1 | 2 | 3 | 4 |
| Favor | Neither favor
nor oppose | Oppose | I don't understand,
need more information |

Suggest changes to existing option(s) or recommend another option(s) and/or general comments about the trend/issue, implications and/or options.

C12. Trend/Issue: Development in Fire Prone Areas

Trend/Issue Definition

As development continues to expand into forested areas of the state, there is an increasing forest fire risk, particularly in those parts of the state which have high forest fire potential. The absence of prolonged severe fire weather throughout the 1990s has the potential to embolden those who wish to develop in fire prone areas. The increased human presence in the wildland/urban interface presents a major challenge in protecting life, property and the forest resource from destructive forest fires.

Implications

Ecological: The areas of greatest concern in Wisconsin for forest fires impacting communities in the wildland-urban interface correlate with the sandy soils and jack pine/scrub oak forest cover type. It is in these forest cover types where historically the largest, most devastating forest fires have occurred in Wisconsin. These forest fire prone areas of the state are greatly influenced and conditions exacerbated by drought conditions. Historically, severe drought cycles have been experienced in Wisconsin every 10-12 years. The ability to use prescribed fire as a management tool in these areas is controversial as development occurs within the forest.

Economic: A large forest fire in Wisconsin that occurs in the jack pine/scrub oak forest cover type will greatly impact primary and secondary housing development in the area. Economic conditions since the mid-1980's have led to the fragmentation of the forest and individuals developing homes on these smaller parcels of land. The size and value of these homes built in the wildland-urban interface area have increased dramatically over the past decade. This increase in housing development has not always been made with proper planning for protection of the structures during forest fire situations. The economic loss associated with a major forest fire in Wisconsin will be much significantly larger in scale do to the increased number of homes, the size of the homes and the value of these homes.

Social: With continued population growth, fragmentation of forest land and construction of primary and secondary homes in the forested areas of the state, the wildland-urban interface area continues to expand in Wisconsin. It is primarily in this wildland-urban interface area that wildland fire causes structural losses to occur. Because more and more people like to live and recreate in forested areas, this will cause more structures to be imperiled by future forest fires. In addition, since humans cause a majority of forest fires in Wisconsin, more people living in the forested areas of the state will lead to a corresponding increase in the number of forest fires occurring in Wisconsin.

Comment—Developing Options

C12. Trend/Issue: **Development in Fire Prone Areas**

Please check one:

- ☐ I am interested in this trend/issue and wish to provide comments (*Please go to options below.*)
- ☐ I am NOT interested in this trend/issue and do not wish to respond (*Please go to next page.*)
- ☐ I am interested in this trend/issue BUT I can not comment because (*Please check one.*)
- ☐ Too complex ☐ I need more information ☐ Other _____

Options

Please circle one response for each option.

- A. Allow landowners to build wherever they desire, irrespective of fire risk.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- B. Increase fire prevention programs by educating landowners and working with developers, building contractors and local public officials on forest fire prevention and designing communities to be fire safe.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- C. Restrict the ability of individuals to develop in fire-prone areas.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- D. Require homeowners in fire-prone areas to take activities to reduce the risk of loss due to wildfires.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

Suggest changes to existing option(s) or recommend another option(s) and/or general comments about the trend/issue, implications and/or options.

C13.Trend/Issue: Consumption patterns are not linked to production.

Trend/Issue Definition

Americans continue to increase their consumption of forest products, while at the same time many are calling for reducing the amount of forest land that is actively managed to produce those products. The disconnect that occurs between resource production and resource consumption is causing ecological, social and economic consequences, including here in Wisconsin. These consequences include the shifting of harvest to different parts of the country and world, consumer decisions about product choices and land use choices.

Implications

Ecological: With increasing global consumption of forest products, the extent to which we reduce production in Wisconsin results in increases in production elsewhere in United States and, more commonly, in other countries. As a result, Wisconsin's forests may see an increase in later-successional forest types (e.g., northern hardwoods) and a decrease in early and mid-successional forest types (e.g., aspen, paper birch, jack pine, red pine, white pine and oak). The ecological impacts of this shift on forests elsewhere in the world depend on where the harvesting occurs and how it is conducted.

Economic: To the extent that production is curtailed within Wisconsin, economic benefits provided by the forest products industry in Wisconsin will be reduced. The benefits will be enjoyed by economies located where the shift in production is transferred. The ability of local communities to facilitate the development of alternative economic opportunities would determine the long-term implications, locally and statewide.

Social: The impacts will vary depending on where people live, work and play. To the extent that the forest products industry is a major economic force statewide, all citizens could be adversely affected if a significant shift out of Wisconsin occurs. Those who live in and/or recreate in the forest will assess the impacts differently, depending on their own values, the extent to which they are tied to the local economy, and how local communities adapt to any changes. More significantly, the consumption levels and patterns within Wisconsin and the other states are deeply rooted in society. Any efforts to reduce or even redirect consumption are likely to be met with significant resistance.

Comment—Developing Options

C13.Trend/Issue: **Consumption patterns are not linked to production**

Please check one:

- ☐ I am interested in this trend/issue and wish to provide comments (*Please go to options below.*)
- ☐ I am NOT interested in this trend/issue and do not wish to respond (*Please go to next page.*)
- ☐ I am interested in this trend/issue BUT I can not comment because (*Please check one.*)
- ☐ Too complex ☐ I need more information ☐ Other _____

Options

Please circle one response for each option.

- A. Implement outreach efforts to connect people with the impacts of their consumption behavior. Provide information that allows consumers to make informed choices.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- B. Assess the ecological, economic and social trade-offs (both within Wisconsin and globally) of reducing, maintaining or expanding the production of forest products within Wisconsin.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- C. Status quo—allow consumption and production to be considered as independent issues.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

Suggest changes to existing option(s) or recommend another option(s) and/or general comments about the trend/issue, implications and/or options.

D1. Trend/Issue: Urbanization is increasing.

Trend Definition

Wisconsin is becoming more urbanized, increasing demand for additional community green space, and putting use pressure on existing urban and nearby recreational green space. Communities are becoming more aware of the need to manage their urban forest and more are doing it; however, the pressure on limited resources to maintain other infrastructure is also increasing.

Implications

Ecological: Forest land within and in close proximity to urbanizing areas is progressively lost to development, reducing species diversity, habitat, soil quality and ground water recharge and increasing storm water runoff, non-point pollution, ambient air temperature, and surface ozone among other things. Forest land that is conserved within development frequently suffers degradation of ecological quality owing to introduction of exotic species, changed surface drainage, overuse and changes in use such as conversion to passive or active recreation. On the other hand, the ecological quality of the urban area itself improves because of the benefits provided by the remnant tree canopy. These benefits however are dependent on the extent, structure and quality of the tree canopy.

Economic: High density development eliminates the forest products that could be harvested. Low density development, while maintaining much of the forest land, frequently eliminates harvesting as a management goal due to the values of the urban owner, again eliminating the economic contribution of forest products to an area's economy.

Desire to gain the greatest dollar value from a land investment through traditional development, both from the property owner and from local governments seeking to increase their tax base, discourages conservation of green space. However, non-traditional development, such as cluster housing, can increase total lot numbers and at the same time conserve a large degree of greenspace.

The remaining tree canopy in a newly urbanized area requires substantially more management by the property owner or local government to prevent it from becoming a liability. This is often not taken into consideration when calculating the cost of development. Development also creates other hidden strain on the infrastructure such as increased demand on roads, sewers, water supply, police and fire, schools, etc. All of these are in competition with urban forest management for limited tax dollars. Inadequate urban forest management will result in reduced property values, further exacerbating development liabilities.

Social: Society loses the benefits to air, water quality, recreation, species diversity and aesthetics that undisturbed forest cover provides. In addition to the loss of these benefits, failure to maintain high quality urban forest canopy reduces quality of life which can lead to flight from the community, exacerbating further development on the urban/rural fringe.

Comment—Developing Options

D1. Trend/Issue: **Urbanization is increasing.**

Please check one:

- ☐ I am interested in this trend/issue and wish to provide comments (*Please go to options below.*)
- ☐ I am NOT interested in this trend/issue and do not wish to respond (*Please go to next page.*)
- ☐ I am interested in this trend/issue BUT I can not comment because (*Please check one.*)
- ☐ Too complex ☐ I need more information ☐ Other _____

Options

Please circle one response for each option.

- A. Allow population growth and the market to dictate development regardless of impact on adjacent forest land and greenspace.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- B. Enhance urban forestry awareness and technical assistance efforts to include land use issues and expand the audience beyond local officials and the general public to include developers, real estate professionals and other groups that impact urban greenspace.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- C. Initiate legislative efforts to regulate development in forest land and mandate conservation ordinances in local municipalities.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

Suggest changes to existing option(s) or recommend another option(s) and/or general comments about the trend/issue, implications and/or options.

D2. Trend/Issue: Development is increasing.

Issue Definition

Development continues to encroach upon forest land in Wisconsin. This trend is expanding the extent of urban forests while decreasing and fragmenting rural forests. People with urban attitudes and expectations are moving into rural areas and lake-front developments. This affects how the forest is used and impacts the ecology of these areas.

Implications

Ecological: The primary ecological implications for natural forest land are the same as those for forest fragmentation (see Issue A12). In addition, urbanites are more likely to manage forest land as a suburban landscape or park, which can affect species diversity, surface water quality and shorelines. For urban forests, development into native woodlands increases the extent and diversity of the overall forest beyond the traditional street, park and landscape trees. Greater canopy accentuates the ecological benefits urban trees provide—improved air and water quality, moderated ambient temperatures and storm water runoff, and expanded habitat and species diversity.

Economic: Economic implications are identified in Forest Fragmentation (Issue A12) for native woodlands and Urbanization (Issue D1) for urban forests.

Social: Issues A12 and D1 identify the social implications of this trend. In addition, urban attitudes and expectations tend toward preservation, esthetics and recreation and away from harvesting. This can lead to anti-harvesting legislation, despite an ever-increasing demand for forest products.

Comment—Developing Options

D2. Trend/Issue: **Development is increasing.**

Please check one:

- ☐ I am interested in this trend/issue and wish to provide comments (*Please go to options below.*)
- ☐ I am NOT interested in this trend/issue and do not wish to respond (*Please go to next page.*)
- ☐ I am interested in this trend/issue BUT I can not comment because (*Please check one.*)
- ☐ Too complex ☐ I need more information ☐ Other _____

Options

Please circle one response for each option.

- A. Accept the loss of timberland and import more forest products to compensate.
- | | | | |
|-------|-----------------------------|--------|--|
| 1 | 2 | 3 | 4 |
| Favor | Neither favor
nor oppose | Oppose | I don't understand,
need more information |
- B. Enhance awareness and educational efforts toward existing and potential urban owners of forest land regarding their forest product consumption and the compatibility of harvesting with “protection,” aesthetics and recreation.
- | | | | |
|-------|-----------------------------|--------|--|
| 1 | 2 | 3 | 4 |
| Favor | Neither favor
nor oppose | Oppose | I don't understand,
need more information |

Suggest changes to existing option(s) or recommend another option(s) and/or general comments about the trend/issue, implications and/or options.

D3. Trend/Issue: Absentee landowners affect urban canopy.

Trend/Issue Definition

There is less concern for urban land stewardship from absentee landowners and renters, so trees and other vegetation are not managed and not replaced as they die. This results in declining canopy in lower socioeconomic areas dominated by rental properties.

Implications

Ecological: About 85% of a typical community is private property. Regardless of a local government's efforts on public property, the ecological benefits of the urban forest are greatly dependent on the character of private property. Declining canopy results in reduced species diversity, habitat, soil quality, air quality and ground water recharge, and increased storm water runoff, non-point pollution, ambient air temperature and surface ozone among other things.

Economic: Reduced tree canopy reduces the economic benefits of the urban forest—increased property values, energy savings, business attraction, improved real estate rental, and increased retail sales—compounding the deterioration of low income neighborhoods.

Social: Loss of urban forest reduces a neighborhood's sense of community and isolates residents by reducing the quality of common meeting and socializing space. The loss of trees not only degrades the beauty of a neighborhood directly, but also reduces the screening effect on deteriorating housing stock. All these in conjunction with the worsened environmental and economic conditions, reduce the quality of life and encourage fleeing the area, exacerbating its decline.

Comment—Developing Options

D3. Trend/Issue: **Absentee landowners affect urban canopy.**

Please check one:

- ☐ I am interested in this trend/issue and wish to provide comments (*Please go to options below.*)
- ☐ I am NOT interested in this trend/issue and do not wish to respond (*Please go to next page.*)
- ☐ I am interested in this trend/issue BUT I can not comment because (*Please check one.*)
- ☐ Too complex ☐ I need more information ☐ Other _____

Options

Please circle one response for each option.

- A. Allow the market to dictate management of private property landscapes in a community.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- B. Through partnerships with local governments and nonprofit organizations, educate property owners, residents, business groups and neighborhood associations on the value of trees and encourage them to plant and manage trees in areas with reduced tree canopy.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- C. Initiate incentive programs for property owners and residents to plant and manage trees on private property in areas with reduced tree canopy.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- D. Mandate minimum landscaping standards to maximize benefits of the urban forest.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

Suggest changes to existing option(s) or recommend another option(s) and/or general comments about the trend/issue, implications and/or options.

D4. Trend/Issue: Exotic species threaten urban forests.

Trend/Issue Definition

Invasive, exotic species planted by urbanites may threaten natural areas in and around communities. Urban forests may become a focal point in a conflict between the traditional horticultural industry and ecological preservationists. In another example, gypsy moth is making its way westward in Wisconsin. Impacts of the moth on the urban forest can be very distressing for community residents, and stop-the-spread and control measures can be controversial.

Implications

Ecological: Exotic plant species per se generally are not a threat, however some species, for example common buckthorn, tartarian honeysuckle, purple loosestrife and garlic mustard, are invasive. Invasive exotics will invade natural remnants in urban areas, crowding out the native plant species and often the wildlife that feed on the native plants. This reduction in biodiversity will set up the ecosystem for further devastation by individual pests, pathogens or abiotic conditions, and may result in potentially serious unknown and unpredictable effects on the balance of the ecosystem such as outbreaks of pest species.

Conversely, exotic plant species play an important part in maintaining biodiversity in the built component of the urban ecosystem. Many native species are not adapted to the highly disturbed and harsh conditions of streets and landscapes.

Economic: Control of invasive species themselves and of outbreaks of pests or pathogens is difficult and costly, taking the limited funds away from routine management. Control efforts must cross jurisdictional and property lines requiring cooperation between thousands of landowners requiring substantial cost beyond the physical control programs. The ecological purist would ban and eradicate all exotic species. However, landscaping is a \$1.3 billion industry in Wisconsin which depends to a large extent on exotic species and many of the economic benefits of the urban forest—increased property values, energy savings, business attraction, improved sales—would be lost.

Social: There are strong philosophical differences on both sides of the exotics issue. Control measures, particularly pesticides, are likewise controversial, creating further conflict among property owners.

Comment—Developing Options

D4. Trend/Issue: **Exotic species threaten urban forests.**

Please check one:

- ☐ I am interested in this trend/issue and wish to provide comments (*Please go to options below.*)
- ☐ I am NOT interested in this trend/issue and do not wish to respond (*Please go to next page.*)
- ☐ I am interested in this trend/issue BUT I can not comment because (*Please check one.*)
- ☐ Too complex ☐ I need more information ☐ Other _____

Options

Please circle one response for each option.

- A. Allow exotic species to naturalize, allowing the ecosystem to come to its own new balance.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- B. Identify the most invasive and potentially damaging exotics, regulate their introduction and work towards suppressing their numbers and effects.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- C. Ban introduction of all exotics and work towards eradication of existing exotics.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

Suggest changes to existing option(s) or recommend another option(s) and/or general comments about the trend/issue, implications and/or options.

E1. Trend: Warming of the earth may affect forest composition, structure and function.

Trend Definition

It is becoming increasingly clear that the earth is warming. However, much is unclear about the long-term effects of this trend. Ecologists speculate that long-term global warming may result in a corresponding response in natural systems that could mean significant changes in forest composition, structure and function.

Implications

Ecological: To the extent that the earth's temperature warms over the long-term, climate and weather patterns would likely change. Average annual precipitation may increase, and the form of this precipitation could be in intense storms, leading to more runoff and flooding. The rain patterns could also shift and occur more in the winter rather than the summer period. Periodic drought during the summer may occur. Other natural disturbance could increase, such as fires and wind events. Forests, dependent on moisture during the growing season, would adapt and ultimately change in composition. Species that are more resilient to drought, fire, and wind, such as oaks and hickories, would likely become more prevalent, replacing the more mesic hardwoods (maples, ashes, etc.). Likewise, the sand areas currently dominated by oaks and pines may dynamically convert to shrub and grass species as the dominant vegetation. Dieback of forest tree species would be gradual yet significant as species composition gradually changed. In general, there would be a significant shift in species ranges within the state. It is possible that growth rates for some forest types could greatly increase with additional warming and availability of increased carbon dioxide. In Wisconsin, these functional changes in our forests could result in dynamic changes in the acreage of forestland and certainly a change in forest types. The biological diversity associated with certain forest types, such as pine and mesic hardwoods, would likely decrease as these forest cover types decrease.

Economic: With a potential change in forest cover, there would certainly be an economic impact on the industries that rely on forests for raw material and the related consumer prices for forest products. Fiber would become limited in the temperate forest regions. Industries would likely shift to the available hardwood fiber thereby shifting the types of products created. Certain groups of species, like the mesic hardwoods, would likely increase in value due to a shortage of supply. Overall forestland land values would increase due to a decrease in forestland.

Social: Social concern would be elevated due to an increase in catastrophic weather events, the loss of biodiversity, the change in forest composition, and the rising costs of certain forest products (paper, lumber, etc.).

Comment—Developing Options

E1. Trend: **Warming of the earth may affect forest composition, structure and function.**

Please check one:

- ☐ I am interested in this trend/issue and wish to provide comments (*Please go to options below.*)
- ☐ I am NOT interested in this trend/issue and do not wish to respond (*Please go to next page.*)
- ☐ I am interested in this trend/issue BUT I can not comment because (*Please check one.*)
- ☐ Too complex ☐ I need more information ☐ Other _____

Options

Please circle one response for each option.

- A. Intensify the field measurement/monitoring of Wisconsin's forest resources documenting annual forest structure and compositional change. Intensify the statewide inventory of biological diversity developing a better understanding of species populations, habitat relationships, and natural community representation.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- B. Maintain the existing inventory systems of Wisconsin's forest resources documenting periodic forest structure and compositional changes. Add biological diversity information to existing databases as opportunities allow.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

Suggest changes to existing option(s) or recommend another option(s) and/or general comments about the trend/issue, implications and/or options.

E2.Trend/Issue: Exotic species threaten ecological balance.

Trend/Issue Definition

Exotic species are an increasing threat to Wisconsin's forests and other ecosystems. Exotic species make their way into Wisconsin through many avenues. Horticulturists have introduced some, like gypsy moth, buckthorn, and Japanese honeysuckle. Others, like the Asian long-horned beetle (ALB) and the fungi that cause Dutch elm disease and oak wilt, are the result of global trade, through which forest products from other areas of the world are shipped to the United States. With global trade continuing to increase, the potential for new introductions of exotics is also increasing.

Implications

Ecological: The recent introductions into North America of the Asian Longhorn Beetle (ALB) and the pine shoot beetle illustrate the continuing threat of exotic insects, diseases and weeds to Wisconsin's forests. Dutch Elm Disease and butternut canker have drastically reduced the amount of elm and butternut in Wisconsin. The gypsy moth is just beginning to have an impact in Wisconsin; it is likely that it will substantially reduce the oak volume in Wisconsin's forests. The ALB has not yet been found in Wisconsin. Garlic mustard and buckthorn threaten to drastically reduce natural reproduction of native tree species and associated species in the herbaceous layers. White pine blister rust has significantly reduced the presence of white pine in high disease-risk areas of Wisconsin's forests.

Economic: Nationwide, hundreds of millions are spent annually to combat exotics. Millions of dollars are spent annually in Wisconsin to slow the spread of the gypsy moth. The first Wisconsin gypsy moth suppression projects occurred in 2000. Woodland owners are spending millions to control exotic weeds in their forests. Land managers have been reluctant to plant white pine in certain areas of northern Wisconsin due to the perceived impact of white pine blister rust. This has reduced the availability of white pine wood products.

Social: Awareness and anxiety of exotics is producing grass roots local, state and national organizations. Email and the World Wide Web is facilitating a rapid citizen response to the exotic threat.

Comment—Developing Options

E2.Trend/Issue: **Exotic species threaten ecological balance.**

Please check one:

- ☐ I am interested in this trend/issue and wish to provide comments (*Please go to options below.*)
- ☐ I am NOT interested in this trend/issue and do not wish to respond (*Please go to next page.*)
- ☐ I am interested in this trend/issue BUT I can not comment because (*Please check one.*)
- ☐ Too complex ☐ I need more information ☐ Other _____

Options

Please circle one response for each option.

- A. Take no action. Allow for invasive, exotic species to invade and establish within forests. Accept the changes that will occur in the forests due to the impact of these insects, diseases and plants.

1
Favor

2
**Neither favor
nor oppose**

3
Oppose

4
**I don't understand,
need more information**

- B. Actively manage state lands to preclude or minimize the impacts of invasive, exotic species. Inform other public and private forest landowners of the status of invasives, and of management approaches techniques to minimize impact.

1
Favor

2
**Neither favor
nor oppose**

3
Oppose

4
**I don't understand,
need more information**

- C. Aggressively work to minimize the impact of invasive species on all forestlands collaborating with public agencies and private partners. Invest in the development of exotic disease resistant forest species and utilize environmentally safe control measures to minimize insect and plant infestations.

1
Favor

2
**Neither favor
nor oppose**

3
Oppose

4
**I don't understand,
need more information**

Suggest changes to existing option(s) or recommend another option(s) and/or general comments about the trend/issue, implications and/or options.

E3. Issue: Forests affect carbon emissions and sinks.

Issue Definition

Wisconsin's land-use has great implications concerning greenhouse gas emissions. The conversion of forest and farms to other uses results in the emission of carbon dioxide and other greenhouse gases. Human-caused greenhouse gas emissions result in global warming. However, Wisconsin's forests are powerful challengers to global warming. A good portion of trees and other living things are made of carbon. As trees and forests grow, they remove carbon dioxide from the air and release oxygen, using the carbon to maintain themselves and grow. Forests provide a very significant carbon sink that helps to combat global warming.

Implications

Ecological: Forests are the most significant, expandable long-term reservoir for carbon. The potential to increase the storage of carbon is linked to the acreage of forests, the age of these forests, and the amount of harvesting or removal of trees as compared to new growth. In Wisconsin the forestland is increasing, the average age of forests is also increasing, and the amount of growth exceeds harvest. Forests can play a greater role as a sink in storing carbon if more lands are planted to forest, or if rotation lengths of existing forests are lengthened, thereby storing more carbon per acre.

Economic: Within Wisconsin, many incentives for managing forestland exist ranging from cost sharing programs to tax laws (i.e. Managed Forest Law). In time, forest landowners may be paid for storing carbon in their forests as a means to offset emissions of greenhouse gases. The concept of carbon credits, a market-based financial incentive for landowners to store carbon in their forests' is developing. If rotation lengths for forest types are lengthened, possible economic implications include a scarcity of raw materials and a greater economic risk to landowners holding trees past a typical rotation age. The price for forest products may increase due to a limit on supply. Reduction in raw material availability may reduce employment and value added products in the forest products industry and subsequently in the rest of the economy through indirect and induced effects. If product substitution occurs, the impact on carbon emissions could be adverse, as substitute products generally require high fossil fuel inputs.

Social: The social implications of global warming include the development of a greater consumer ethic. This ethic encourages a focus on the reduction of greenhouse gas emissions and a responsibility to address the effects of excess carbon. Forests are viewed as a desirable storehouse of carbon, possibly being the most easily recognized carbon pool. The general public must closely examine the conversion of forestland to non-forest type use and forest harvesting levels. Land-use planning efforts must become a high priority for communities, as populations require additional growth and development.

Comment—Developing Options

E3. Issue: **Forests affect carbon emissions and sinks.**

Please check one:

- ☐ I am interested in this trend/issue and wish to provide comments (*Please go to options below.*)
- ☐ I am NOT interested in this trend/issue and do not wish to respond (*Please go to next page.*)
- ☐ I am interested in this trend/issue BUT I can not comment because (*Please check one.*)
- ☐ Too complex ☐ I need more information ☐ Other _____

Options

Please circle one response for each option.

- A. Encourage an increase of forestland through planting new forests and regenerating forests after harvest. Carefully plan and minimize the land use change from forest to non-forest uses. Encourage rotations in management of forests that maximize long-term carbon. Carefully monitor and balance the total amount of harvest with the total forest growth. Expand existing forest incentive programs to include carbon storage as a long-term management objective. Encourage the development of market based economic incentives, such as carbon credits, to provide additional forestland incentives. Encourage and participate in land-use planning in local, regional or statewide efforts.

1
Favor

2
**Neither favor
nor oppose**

3
Oppose

4
**I don't understand,
need more information**

- B. Wait until we learn more about the relationship between human activity and global warming before issuing carbon credits.

1
Favor

2
**Neither favor
nor oppose**

3
Oppose

4
**I don't understand,
need more information**

- C. Allow markets to dictate the values of forestlands to be featured.

1
Favor

2
**Neither favor
nor oppose**

3
Oppose

4
**I don't understand,
need more information**

Suggest changes to existing option(s) or recommend another option(s) and/or general comments about the trend/issue, implications and/or options.

E4. Trend/Issue: Global Demand for wood products is increasing.

Trend/Issue Definition

As world populations increase, the demand for wood and wood products continue to increase. Wisconsin will be affected by this trend as the desire for forest product sustainability and national self-sufficiency increases.

Implications

Ecological: Global demands for wood products are increasing. The increases in demand for wood follow very closely increases in global population. The industrial nations have 20% of the world's population and use approximately 80% of the wood products. Each person in the United States consumes about 70 cubic feet of wood per year in various wood products and is estimated that the population in the United States doubles every 63 years. Average global production is 24 cubic feet per person. The goal of most developing nations is to develop to our standard of living. If this occurs a significant increase in wood product demand will occur.

Economic: The steady increase in demand for wood will continue to drive forest product markets. Developing countries are using their forests more intensively and competing with U.S. companies. Companies in developing countries are quite competitive, even with higher logistical costs, due to limited environmental regulation and cheap labor in their countries. This competitive edge is further compounded by the removal of timber resources from timber production in the U.S. based on social issues. Even though demand will increase globally we could see a reduction in demand for domestically produced products, due to the lack of competitiveness of domestic firms. Decreased domestic demand would result in the loss of jobs and the ability to better manage the resource.

Social: The increased global demand for wood products could help to provide benefits to the citizens of Wisconsin in terms of jobs and recreational opportunities in the forests. This will occur if the industry is not excessively constrained by social decisions that reduce its productivity to the point that the industry can not compete in the market place. If this occurs, a loss of jobs and infrastructure also used by recreation industries could occur.

Comment—Developing Options

E4. Trend/Issue: **Global Demand for wood products is increasing**

Please check one:

- ☐ I am interested in this trend/issue and wish to provide comments (*Please go to options below.*)
- ☐ I am NOT interested in this trend/issue and do not wish to respond (*Please go to next page.*)
- ☐ I am interested in this trend/issue BUT I can not comment because (*Please check one.*)
- ☐ Too complex ☐ I need more information ☐ Other _____

Options

Please circle one response for each option.

- A. Allow global market forces and business competitiveness to prevail.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- B. Maintain existing efforts to maintain and promote sustainable forest management at the state and national level.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- C. Intensify efforts to promote sustainable forestry in Wisconsin.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- D. Promote reduced consumption of forest products.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

Suggest changes to existing option(s) or recommend another option(s) and/or general comments about the trend/issue, implications and/or options.

E5. Trend/Issue: Sustainable forest products may provide a global advantage.

Trend/Issue Definition

Wisconsin's forests have been increasing in volume for decades. To meet increasing global demand for wood products, sustainable forest management in Wisconsin forests has the potential to take some of the pressure off more at-risk forests in other areas. Sustainable forest products produced in Wisconsin may be a good substitute for products made from wood harvested in tropical or boreal forests, where sustainable harvest is more difficult to maintain due to social needs or ecological characteristics.

Implications

Ecological: Wisconsin forestland increased by 640,000 acres between 1983 and 1996. Currently about 70% of net annual growth is harvested each year leaving 30% of the growth. The management practices encouraged by forest tax law incentives also encourage sustainable forest management. The long history of documented forest improvement in Wisconsin easily supports the premise that sustainable forestry is being practiced in Wisconsin. The amount of forest products certified as coming from forestland that is being sustainably managed is slightly increasing in Wisconsin.

Economic: The world market place is demanding wood products that are produced in a sustainable manner. Wisconsin forest landowners and forest industry have the potential to capitalize on this growing demand if a system to document and track sustainable wood product production can be developed that is cost effective for the small non industrial private landowner. Sustainable wood products could provide a competitive advantage over the products produced in developing countries in a non-sustainable manner.

Social: Society is starting to place a value on products produced in a sustainable and environmentally friendly way. Historically, the more wealthy a nation, the more attention that nation's society will pay to environment. This trend will favor a state like Wisconsin where forests were cut over and are now recovered and being managed in sustainable way.

Comment—Developing Options

E5. Trend/Issue: **Sustainable forest products may provide a global advantage**

Please check one:

- ☐ I am interested in this trend/issue and wish to provide comments (*Please go to options below.*)
- ☐ I am NOT interested in this trend/issue and do not wish to respond (*Please go to next page.*)
- ☐ I am interested in this trend/issue BUT I can not comment because (*Please check one.*)
- ☐ Too complex ☐ I need more information ☐ Other _____

Options

Please circle one response for each option.

- A. Do nothing; allow global market forces to prevail.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- B. Continue current efforts to promote sustainable management of Wisconsin forests.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- C. Intensify this effort in Wisconsin through assistance to private landowners to enhance the sustainability of Wisconsin's forests.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

Suggest changes to existing option(s) or recommend another option(s) and/or general comments about the trend/issue, implications and/or options.

E6. Issue: Criteria and indicators for sustainable forestry are being developed.

Issue Definition

Wisconsin forest managers are joining other landowners across the country in meeting the commitment the U.S., made as part of the Earth Summit, to practice sustainable forestry. Accomplishing this requires the development of criteria and indicators that we can use to gauge progress. Sustainability criteria are being developed for rural Lake States forests as well as for urban forests.

Implications

Ecological: The sustainable forestry criteria developed for ecological implications include 2 major categories: 1) the Maintenance of Biological Resources (elements of this criteria include diversity of forest communities, species diversity, genetic diversity, productive capacity of forest sites, forest structure, forest composition and forest function) and 2) the Maintenance of Soil, Water and Air quality (elements of this criteria are water quality, soil quality, and air quality). Numerous indicators are identified for each of the criteria and associated elements. A geographic scale has also been introduced to the process of measurement, ranging from state or province to county or forest management unit to the woodlot scale. These indicators may or may not be appropriate measures for any particular scale. The ecological implications for implementing a system of criteria and indicators are that much management effort will be placed on the actual process of measurement, analysis of data, and adaptation of management actions, as needed. Adapting management to new information will become a very normal procedure. In addition, where some indicators are easily measured (for example acres of forest), other indicators are much more complex (ex. biodiversity). Expertise will need to be available to develop these measurement systems. Ecological benefits should be realized because management will change to address concerns.

Economic: The sustainable forestry criteria developed for economic implications include the Provision of Multiple Economic Benefits (elements of the criteria include competitiveness of forest-based industries, community vitality, and goods and services produced). As stated earlier in the ecological implications, geographic scale has also been introduced to the process of measurement, ranging from state or province to county or forest management unit to the woodlot scale. These indicators may or may not be appropriate measures for any particular scale for specific economic indicators. A shift in resource personnel or skills will be needed in agencies to foster monitoring expertise for each of the criteria. Practical economic considerations include measuring the variety of ecological, economic and social criteria and indicators which will require spending resources on inventory, monitoring and analysis efforts by agencies and resource managers. By addressing ecological concerns through management, healthier forest systems should develop ecological benefits, which ultimately relates to healthy, sustainable economies.

Social: The sustainable forestry criteria developed for social implications include the Maintenance of Community and Cultural Values (elements of this criteria include historical and cultural values, affordability of forestland, personal and spiritual values, and owner responsibility). The social implications include developing a social acceptance and understanding that resource management includes a greater emphasis on monitoring efforts for ecological, economic and social criteria. Likewise, developing measures of values, such as spiritual, personal, cultural, etc., is very difficult. Approaches used in measuring these criteria vary greatly and one value may not necessarily equate to another on an equal basis. Gathering information and using this information in decision-making will be important for successful integration efforts.

Comment—Developing Options

E6. Issue: **Criteria and indicators for sustainable forestry are being developed.**

Please check one:

- ☐ I am interested in this trend/issue and wish to provide comments (*Please go to options below.*)
- ☐ I am NOT interested in this trend/issue and do not wish to respond (*Please go to next page.*)
- ☐ I am interested in this trend/issue BUT I can not comment because (*Please check one.*)
- ☐ Too complex ☐ I need more information ☐ Other _____

Options

Please circle one response for each option.

- A. Periodically review and adapt the list of Criteria and Indicators. Invest in inventory, monitoring and analysis efforts to better document changes in ecological, economic and social criteria and indicators.
- | | | | |
|-------|-----------------------------|--------|--|
| 1 | 2 | 3 | 4 |
| Favor | Neither favor
nor oppose | Oppose | I don't understand,
need more information |
- B. Maintain the status quo of measurement/inventory/monitoring systems for Criteria and Indicators.
- | | | | |
|-------|-----------------------------|--------|--|
| 1 | 2 | 3 | 4 |
| Favor | Neither favor
nor oppose | Oppose | I don't understand,
need more information |
- C. Actively pursue the use of Criteria and Indicators and promote the use of certification by landowners.
- | | | | |
|-------|-----------------------------|--------|--|
| 1 | 2 | 3 | 4 |
| Favor | Neither favor
nor oppose | Oppose | I don't understand,
need more information |

Suggest changes to existing option(s) or recommend another option(s) and/or general comments about the trend/issue, implications and/or options.

Additional 1. Issue: Public outreach and education

Issue Definition

Every Wisconsin citizen and visitor depends upon forest resources for shelter, wood products such as furniture and paper, and for cleaner air and water. Most everyone enjoys the beauty of trees and forests, whether in an urban or rural setting. And many Wisconsin citizens depend upon forests or the manufacture of forest products for their livelihood. Despite this widespread dependence on forests and forest products, many Wisconsin citizens and visitors believe that it is wrong to harvest trees, and they do not know that forests can be sustainably managed to balance ecological, social, and economic needs and values for present and future generations. Current forestry public outreach and education efforts are insufficient to foster an appreciation for the value of forests in everyone's lives and the benefits of sustainable forestry for the general public now and in the future.

Implications

Ecological: Many Wisconsin citizens and visitors, particularly those with urban backgrounds, have little understanding of the basics of forest ecology or the ecological benefits of trees and forests for the air, water, soil, plants, and animals of the state. Improving understanding by the public can help inform decision-making processes pertaining to forests.

Economic: Many Wisconsin citizens and visitors have little understanding of the major role that forest and forest products play in Wisconsin's economy.

Social: All Wisconsin citizens and visitors consume and use wood in many ways every day, yet many believe that harvesting trees is wrong. They do not understand that wood is a renewable resource and that forests can be managed sustainably. Negative public opinion about forestry practices and professionals is generally based on misunderstanding and stereotypes.

Comment—Developing Options

Additional 1. Issue: **Public outreach and education**

Please check one:

- ☐ I am interested in this trend/issue and wish to provide comments (*Please go to options below.*)
- ☐ I am NOT interested in this trend/issue and do not wish to respond (*Please go to next page.*)
- ☐ I am interested in this trend/issue BUT I can not comment because (*Please check one.*)
- ☐ Too complex ☐ I need more information ☐ Other _____

Options

Please circle one response for each option.

- A. Continue with present efforts, accepting that public understanding and perceptions about forestry practices.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- B. Invest in improving the effectiveness of public education and outreach efforts to better facilitate public involvement in decision-making.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- C. Work with partners to maximize the mutual investment in public education and outreach and the pool of talent available to address this effort.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

Suggest changes to existing option(s) or recommend another option(s) and/or general comments about the trend/issue, implications and/or options.

Additional 2.Issue: **Rising forestland property taxes are impacting short and long-term management decisions.**

Issue Definition

Two factors, rising forestland values relative to other property and the Farmland Use Value Assessment Law, are redirecting a greater share of the state property tax burden to woodland. The demand for forestland for recreation, housing and investment purposes has resulted in assessed values doubling roughly every three years in recent trends reported by the Wisconsin Department of Revenue. Many landowners have experienced proportional increases in their tax bills. The Farmland Use Value Assessment program, fully implemented in 2000, has also had an effect of shifting tax burden to non-agricultural land, notably to private forestland.

Implications

Ecological

- Conversion of woodland to pasture or crops in order to take advantage of Farmland Use Value Assessment, resulting in loss of forestland and an increase in soil compaction and water quality problems related to grazing forests.
- Accelerated parcelization and fragmentation, results in the ecological impacts described in Trend C2.
- Resource exploitation including premature timber cutting to generate income to pay taxes.
- For some landowners, an increased interest in land management to care for an increasingly valuable asset.

Economic

- Increased enrollment of land under the Managed Forest Law (which has experienced a 75% increase in applications between 1998 and 2001), including increased costs to the state for administration of the program.
- Uncertainty for landowners whose long-term management decisions are put on hold over fear of rapidly rising taxes and whether they can afford the cost of owning woodland.
- A long-term loss in the supply of forest products as productivity declines due to premature or destructive cutting on the part of some landowners.
- A diminished supply of timber from landowners that decide the recreational and aesthetic value of woodland exceeds the value for products.
- A bigger demand for professional resource management advice from those landowners who recognize the importance of caring for an increasingly valuable asset.

Social

- Parcelization of woodland to reduce tax liability.
- Increased closure of land to public access.
- Instability of traditional farmland ownership as farmers divest and sell off woodland to reduce expenses.

Comment—Developing Options

Additional 2.Issue: Rising forestland property taxes are impacting short and long-term management decisions.

Please check one:

- ☐ I am interested in this trend/issue and wish to provide comments (*Please go to options below.*)
- ☐ I am NOT interested in this trend/issue and do not wish to respond (*Please go to next page.*)
- ☐ I am interested in this trend/issue BUT I can not comment because (*Please check one.*)
- ☐ Too complex ☐ I need more information ☐ Other _____

Options

Please circle one response for each option.

- A. Do nothing, allow current tax law to affect trends in forestland ownership.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- B. Develop a long-term property tax strategy that will protect the forest resources of the state. Encourage the Departments of Revenue, Natural Resources, and Agriculture and Consumer Protection to complete a comprehensive study on the future taxation of agricultural, forestland and other undeveloped land to protect the natural resources of the state.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- C. Seek limited revisions to the Farmland Use Value Assessment statutes to remove incentives to convert woodland to agricultural use categories. Build incentives into the Use Valuation Assessment law to promote the practice of sustainable forestry.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- D. Enact laws that would regulate land use conversions and require implementation of approved forest management practices. Develop tax penalties for converting woodland to other uses.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

Suggest changes to existing option(s) or recommend another option(s) and/or general comments about the trend/issue, implications and/or options.

Additional 3.Trend: Human Population Increase

Trend Definition:

While seldom considered by forest resource managers, human population growth will probably exert an influence over many of their actions. And because population growth is gradual, it will be difficult to assess the impact it has on the use of forests from the standpoint of a relatively short planning horizon (10-20 years). Still, because many management decisions are based on long time frames (>50 years), a substantially larger future population must be assumed when predicting the decision outcomes. The population of Wisconsin increased by 9.6% between 1990 and 2000, less than the nationwide increase of 13.1%. However, Wisconsin's forests will feel the impact of growing numbers of recreationists and property owners from outside of the state as well as wood products consumers from around the globe.

Implications

The effects of population growth on forests are easily confused with other factors, such as economic trends and social preferences. The following list of implications, therefore, deals with issues that are directly sensitive to increasing human numbers.

Ecological: The trend toward increasing permanent forest fragmentation and declining populations of some species may continue due to possible growth in the number of housing units in forests.

Larger numbers of people recreating and building homes in forests may hamper the survival of some forest mammals, such as timber wolves and bobcats, which have large home ranges that depend on remote tracts of forest with low human presence.

Economic: The demand for forest products will increase. Consequently, forest management and capital investment in forest operations may intensify.

- Recreational use of forests will increase and fuel the growth of the tourist-based service sector in forested regions.
- The acreage available for harvesting timber may shrink due to the following:
 - ✓ More residences built in forests may exclude harvesting due to aesthetic objections of property owners.
 - ✓ More recreationists visiting forests may increase public pressure to restrict harvesting on public lands.
 - ✓ Private parcels (<20 acres) that are too small for viable commercial logging will account for a larger area of the forest resource statewide.

Social: The parcelization of forestland will increase, increasing the amount of forest land belonging to small, private ownerships.

- An increase in the number of small, private forest land owners could boost demand for private forestry assistance from DNR Forestry and private consultants.
- The likely increase in the number of recreationists on public lands could intensify conflicts between different user groups. Trail use will increase, intensifying conflicts on existing trails and creating demand for additional ones.

Comment—Developing Options

Additional 3.Trend: **Human Population Increase**

Please check one:

- ☐ I am interested in this trend/issue and wish to provide comments (*Please go to options below.*)
- ☐ I am NOT interested in this trend/issue and do not wish to respond (*Please go to next page.*)
- ☐ I am interested in this trend/issue BUT I can not comment because (*Please check one.*)
- ☐ Too complex ☐ I need more information ☐ Other _____

Options

Please circle one response for each option.

- A. Do nothing, allow human population increase and associated social and market-based forces to freely affect the forest resource.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- B. Raise awareness about the ecological, economic, and social impacts of population increases.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

Suggest changes to existing option(s) or recommend another option(s) and/or general comments about the trend/issue, implications and/or options.

Additional 4. Issue: Land trusts and state and county land purchases

Issue Definition

With changes in ownership of industrial lands and demographic changes in non-industrial private landowners, the amount of forested land open for public use is decreasing. Recently, large blocks of forested lands have transferred ownership not only between industry but also into government and non-industrial private ownership. This issue has implications for the future of public recreation. There are important ecological, economic, and social concerns as these large blocks of forest are sold, divided and potentially converted from forested lands to other uses. The ability of the State and the Counties, in concert with Land Trusts, to acquire some of these lands can be controversial when private ownership of forested tracts is in high demand.

Implications

Ecological

- Fragmentation—Public acquisition or protection of large block of forested lands will result in less permanent fragmentation than if the lands were in private ownership. The size of forested parcels in private ownership has decreased in recent years. This leads to increased density of roads, buildings and overall changes in land use known as permanent fragmentation. Wildlife habitat and species composition is impacted. Permanent fragmentation has far greater impacts to forested ecosystems than temporary habitat fragmentation, which may occur as a result of activities such as timber harvests.
- Public ownership provides a greater opportunity to implement ecologically sustainable land management. Currently only 20% of private landowners employ the services of a professional forester when harvesting timber. Today's forestland owners are from urban backgrounds and generally less connected to the rural landscape of Wisconsin.
- Endangered and threatened resources would benefit from increased public ownership. Inventory and management of these resources is difficult on private lands and there is an increased likelihood of activities, which may negatively impact those resources.
- Intolerant forest types such as aspen, birch and jack pine are declining. As private parcels "down-size" there is less likelihood that today's aesthetically conscious private landowners are going to be willing to manage for these even-aged types using scientifically proven methods such as clearcutting.

Economic

- Wisconsin's forest industry is a national leader. The economic impact of the forest industry is very significant when looked at from a nationwide, statewide, county perspective. To maintain a sustainable flow of raw forest products to industry will require sound forest management. Public ownership promotes these practices.
- Additional forestry staff would be needed to manage any large increases in public lands.
- Tax structure—the current system of aids in lieu of taxes makes provisions to local units of government to compensate for public land ownership.
- Purchase of Development rights would minimize the perceived drawbacks of removing lands from the property tax roles.
- Public purchase of lands by fee title or the purchase of development rights will require significant amount of tax dollars.

Social

- Only 270,000 of the over 5 million state citizens own forestland. Public land ownership would ensure hunting, fishing and recreational opportunities are available for all citizens.
- Public purchase of additional private lands may deny some private individuals an opportunity to own their part of the landscape. Some may view this as taking away a “right”.
- Tourism industry is heavily dependent on an interconnected system of trails (snowmobile, hiking, biking, ATV, horse). Public ownership would facilitate the connectivity of the trails.

Comment—Developing Options

Additional 4. Issue: **Land trusts and state and county land purchases**

Please check one:

- ☐ I am interested in this trend/issue and wish to provide comments (*Please go to options below.*)
- ☐ I am NOT interested in this trend/issue and do not wish to respond (*Please go to next page.*)
- ☐ I am interested in this trend/issue BUT I can not comment because (*Please check one.*)
 - ☐ Too complex ☐ I need more information ☐ Other _____

Options

Please circle one response for each option.

- A. Do not pursue or encourage the purchase of large blocks of forestland by the public.
- | | | | |
|------------|----------------------------------|-------------|---|
| 1
Favor | 2
Neither favor
nor oppose | 3
Oppose | 4
I don't understand,
need more information |
|------------|----------------------------------|-------------|---|
- B. Encourage public purchase of forestland/development rights in areas with unique natural resource features and those that adjoin or connect current public ownership.
- | | | | |
|------------|----------------------------------|-------------|---|
| 1
Favor | 2
Neither favor
nor oppose | 3
Oppose | 4
I don't understand,
need more information |
|------------|----------------------------------|-------------|---|
- C. Encourage public purchase or purchase of conservation easements of all remaining available large blocks of forestland regardless of location.
- | | | | |
|------------|----------------------------------|-------------|---|
| 1
Favor | 2
Neither favor
nor oppose | 3
Oppose | 4
I don't understand,
need more information |
|------------|----------------------------------|-------------|---|

Suggest changes to existing option(s) or recommend another option(s) and/or general comments about the trend/issue, implications and/or options.

Additional 5. Issue: **Logger Certification**

Issue Definition

The vast majority of loggers are professional businesspeople with a deep regard for and love of forests and the environment. They work with the state's renewable resources on a daily basis and do their best to balance the economic viability of their businesses with environmentally friendly and sustainable forest management practices. This is little recognized by the public and loggers have responded by adopting training standards as a means of demonstrating the occupation's professionalism.

Implications

Ecological: The products and benefits demanded by society from the forest cannot be maintained without the use of sustainable forest ecosystem management practices, which includes the harvesting of trees. The logger provides one of the tools used to manage the resource in an economical way. The value of the products derived from a forest provides the funds that a landowner needs to pay for management of his forestland. Forests are constantly changing and as they age nature will remove trees through the natural processes of insects, disease and fire. Use of logging to harvest trees prior to natural mortality provides some economic return and helps maintain a healthy forest.

Economic: When the ethical, law-abiding logger has to compete with those who don't meet that criteria, a disincentive to log in a sustainable manner is created. As an example, when an ethical logger abides by all the laws and tries to do what is environmentally and sustainably sound, he may have to compete with another logger who: 1) does not have workers' compensation insurance for protection of his employees, 2) consistently trucks overweight loads or steals a load of wood here and there, and 3) has no concern over what he does to the forest or what his actions mean for future generations. The ethical logger obviously loses, but he is not alone; the landowner loses, forest industry loses, and the public in general loses. Certification would allow a distinction to be made between these two types of loggers and brought to public attention.

Social: When poor practices are used by one logger it reflects negatively on the logging industry and forest management as a whole. The logger who practices unethical methods also destroys public trust and in so doing reduces the management that occurs on private lands and hurts sustainable forestry as a whole. It can take many years to rebuild trust and re-establish a sustainable forest after a bad experience with a timber harvest.

Comment—Developing Options

Additional 5. Issue: **Logger Certification**

Please check one:

- ☐ I am interested in this trend/issue and wish to provide comments (*Please go to options below.*)
- ☐ I am NOT interested in this trend/issue and do not wish to respond (*Please go to next page.*)
- ☐ I am interested in this trend/issue BUT I can not comment because (*Please check one.*)
- ☐ Too complex ☐ I need more information ☐ Other _____

Options

Please circle one response for each option.

- A. Adopt and support the Master Logger certification program that has oversight from the American Logger Council.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- B. Develop a logger certification program for Wisconsin independent of those that are being developed.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- C. Do not pursue logger certification.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

Suggest changes to existing option(s) or recommend another option(s) and/or general comments about the trend/issue, implications and/or options.

Additionl 6. Trend/Issue: Production of Nursery Stock

Trend/Issue Definition

There are both public and private nurseries in Wisconsin involved with the production and distribution of bareroot nursery stock for conservation plantings by Wisconsin landowners. Each sector fills a vital role in providing for adequate nursery stock, a local community economic base and employment opportunities. The issue is the role the Department's state nursery program and the private sector nurseries will fulfill in the future in providing nursery stock for reforestation and conservation purposes in Wisconsin.

Implications

Ecological: The state nursery program is currently providing native Wisconsin species, from adapted seed sources, to landowners in Wisconsin for reforestation and restoration planting purposes. Seedlings from the state nurseries program can only be utilized for conservation plantings. They cannot be utilized for ornamental, landscaping or Christmas tree production. Private sector nurseries provide a much broader listing of species, of both native and non-native species, that are adapted to growing in Wisconsin.

Economic: The state nursery program currently produces and distributes between 19 and 22 million seedlings annually for reforestation of state, county, industrial and private lands in Wisconsin. The private sector produces and distributes an additional 3 to 5 million seedlings annually for conservation purposes.

The mission of the state nursery program is "to insure a consistent supply of high quality seedlings, of desirable forest species, at an economical price, to encourage reforestation in Wisconsin". The state nursery program is required by state statute to be financially self-supporting from revenue generated by the sale of nursery stock. The purchaser of state nursery stock pays for the Department's entire cost of production, distribution and administration of the state nursery program. In addition, a surcharge on all state nursery stock sold contributes \$200,000 annually for the suppression of gypsy moth in Wisconsin. Concern has been expressed by the private sector that the state's nurseries unfairly compete, due to the absence of a profit motive.

Social: Wisconsin has been considered a leader in the nation for reforestation practices since the CCC era. The state nursery and reforestation programs have been the backbone of Wisconsin's conservation programs by providing seedlings for planting on erodible agricultural lands. This prevents soil erosion and improves water quality, increases wildlife habitat, provides for aesthetic beauty and conserves energy. In addition, the state nurseries have contributed to the development of Wisconsin's forest industry by growing the type and quality of seedling needed by the industry to provide the necessary fiber for industry in the future.

The state's nursery program has been a leader in the stewardship of Wisconsin's natural resources since 1911, producing over 1.4 billion seedlings for planting in Wisconsin. Partnerships and cooperative agreements between state, county, industry and private concerns have been built on the availability of high quality seedlings, economical seedling prices, known seed sources, and genetically superior nursery stock from the state nursery program.

Comment—Developing Options

Additional 6. Trend/Issue: **Production of Nursery Stock**

Please check one:

- ☐ I am interested in this trend/issue and wish to provide comments (*Please go to options below.*)
- ☐ I am NOT interested in this trend/issue and do not wish to respond (*Please go to next page.*)
- ☐ I am interested in this trend/issue BUT I can not comment because (*Please check one.*)
- ☐ Too complex ☐ I need more information ☐ Other _____

Options

Please circle one response for each option.

- A. Reduce the seedling inventory in state nurseries and rely more on private companies to supply seedlings to Wisconsin landowners.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- B. Maintain the state nursery program at its current level and work cooperatively with private nurseries to supply additional seedlings.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- C. Increase the state nursery program to meet all Wisconsin landowner needs with little dependence on private nurseries.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- D. Eliminate the state nurseries; rely on private sector to produce all needed stock.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

Suggest changes to existing option(s) or recommend another option(s) and/or general comments about the trend/issue, implications and/or options.

Additional 7. Trend/Issue: Pesticides, herbicides and pollutants.

Trend/Issue Definition

The use of insecticides and herbicides in forest management can rapidly reduce diversity of insects and plants in the area where they are used. Herbicides are commonly used in forest management to protect new tree plantations from weed competition; insecticides are rarely used. The misuse of these pesticides can cause their movement off the application site in the air and ground water. Industrial and auto air pollutants impact forest biodiversity gradually and on a regional scale by reducing the vigor of susceptible species such as white pine and quaking aspen.

Implications

Ecological: Applications of broad-spectrum insecticide may kill many non-target insect species in the area sprayed. Bacteria-based insecticides such as *Bacillus thuringiensis* (Bt) kill a much smaller number of non-target species. Predators that feed on these insects are required to search over a wider area or move their nesting sites. While the impact on non-target populations is sudden, the populations normally recover in one or two years.

Herbicide may kill a wide or narrow spectrum of plant species depending on the product used. Plant diversity in the area sprayed is drastically reduced very quickly and may not recover for many years. Broadcast applications are far more disruptive than narrow band applications. Some herbicides are beneficial to endangered species by benefiting host plants, for example, those herbicides used to kill grass and sedge thereby releasing lupine, a host for Karner blue butterfly larvae.

Misapplication of pesticides on very sandy soils or where fractured limestone is close to the surface can result in the pesticide polluting the ground water.

Airborne pollutants such as ozone, SO₂ and NO₂ at high concentrations can damage foliage, acidify some soils and lead to reduction of pollution susceptible species such as white pine and quaking aspen.

Economic: Herbicides are often used in forest management to avoid losses caused by invasive plants. Insecticides are rarely used in forest management but when they are used it is to avoid catastrophic losses due to specific pests like gypsy moth. The cost of control of these insects and invasive plants would be impossible or much more costly without them.

Airborne and water born pollutants have had minimal impact on Wisconsin's forests. However, air pollutants occasionally damage shade trees in southeastern Wisconsin.

Social: While the potential for contaminating water wells exists, none in Wisconsin are known to have been caused by forest management uses of pesticides. Occasionally, airborne drift of herbicides causes damage to neighboring vegetation, which triggers complaints by landowners and investigation by government officials.

Pollutants have had minimal social impact on Wisconsin's forests. Airborne pollutants cause occasional damage to shade trees resulting in complaints by residential landowners.

Comment—Developing Options

Additional 7. Trend/Issue: **Pesticides, herbicides and pollutants.**

Please check one:

- ☐ I am interested in this trend/issue and wish to provide comments (*Please go to options below.*)
- ☐ I am NOT interested in this trend/issue and do not wish to respond (*Please go to next page.*)
- ☐ I am interested in this trend/issue BUT I can not comment because (*Please check one.*)
- ☐ Too complex ☐ I need more information ☐ Other _____

Options

Please circle one response for each option.

- A. Discontinue the use of pesticides. Accept the changes that occur in forests due to this management action.

1
Favor

2
**Neither favor
nor oppose**

3
Oppose

4
**I don't understand,
need more information**

- B. Minimize the use of pesticides, integrating practices that encourage vigorous forests that prevent or avoid losses caused by insects and competition by weeds. When pesticide use is necessary, continue adherence to label instructions regarding application essential to prevent detrimental effects.

1
Favor

2
**Neither favor
nor oppose**

3
Oppose

4
**I don't understand,
need more information**

- C. Encourage the use of pesticides wherever cost effective.

1
Favor

2
**Neither favor
nor oppose**

3
Oppose

4
**I don't understand,
need more information**

Suggest changes to existing option(s) or recommend another option(s) and/or general comments about the trend/issue, implications and/or options.

Additional 8. Trend/Issue: **Integration with other agencies and disciplines.**

Trend/Issue Definition

By definition, foresters manage systems—forest ecosystems. However, all the applicable expertise does not reside in the forestry profession or within the Department of Natural Resources. To achieve the goal of protecting and sustainably managing Wisconsin’s forests, many disciplines and many public and private partners need to work together.

Implications

Ecological: Bringing together a full range of disciplines germane to sustainably managing forests, and the agencies that can facilitate its application, can help identify and assess the full range of impacts on forests of pursuing various management options, and facilitate the implementation of appropriate activities. As a result, decisions will reflect a more robust assessment of key issues and concerns across all three “legs” of sustainability—ecological, economic and social.

Economic: Same as ecological.

Social: Same as ecological and economic.

Comment—Developing Options

Additional 8. Trend/Issue: **Integration with other agencies and disciplines.**

Please check one:

- ☐ I am interested in this trend/issue and wish to provide comments (*Please go to options below.*)
- ☐ I am NOT interested in this trend/issue and do not wish to respond (*Please go to next page.*)
- ☐ I am interested in this trend/issue BUT I can not comment because (*Please check one.*)
- ☐ Too complex ☐ I need more information ☐ Other _____

Options

Please circle one response for each option.

- A. Promote increased collaboration by the full range of disciplines applicable to sustainable forestry. Currently, collaboration occurs mostly between foresters, wildlife biologists and conservation biologists. It will be necessary to ascertain how to maximize the value and efficiency of more extensive collaboration given the wide range of demands on members of these disciplines and the potentially limitless opportunities for such collaboration.

1
Favor

2
**Neither favor
nor oppose**

3
Oppose

4
**I don't understand,
need more information**

- B. Promote increased collaboration among all agencies—local, state and federal—engaged in promoting, supporting and implementing sustainable forestry within Wisconsin. Collaboration currently occurs between agencies on a case-by-case and issue-by-issue basis, however, there has not been an effort made to bring all affected agencies together to address big-picture issues.

1
Favor

2
**Neither favor
nor oppose**

3
Oppose

4
**I don't understand,
need more information**

- C. Status quo: Allow existing levels of collaboration among disciplines and agencies to continue and evolve as issues and interests dictate.

1
Favor

2
**Neither favor
nor oppose**

3
Oppose

4
**I don't understand,
need more information**

Suggest changes to existing option(s) or recommend another option(s) and/or general comments about the trend/issue, implications and/or options.

Additional 9. Issue: **Intrinsic value of land.**

Issue Definition

People value forests for a wide array of benefits. Some of these benefits are utilitarian and others are often defined as intrinsic, i.e., values unrelated to direct human benefit. Examples cited include the person who values wilderness even though they have no intention of ever visiting a wilderness area, and the spiritual values of forests. Although these might both be strictly defined as human-based values, they are nonetheless often viewed as “nontraditional” values of forests. There are widely ranging opinions about the relative importance of intrinsic values, probably due to different value paradigms of those in debates about forests.

Implications

Ecological: It can be argued that at least part of the reason people advocate the existence of all species is for intrinsic reasons, not simply because they may directly benefit humans. To the extent intrinsic values affect decisions regarding management of land they will have ecological implications. The specific implications will vary depending on the value and its manifestation (e.g., species or condition). It seems that intrinsic values are most often used to advocate less human intervention in forests. As a result, placing a high degree of emphasis on intrinsic values might lead to less human-based disturbance in forests, favoring later successional forest types over early and mid-successional forest types.

Economic: The specific implications will vary depending on the value and its manifestation (e.g., species or condition). It seems that intrinsic values are most often used to advocate less human intervention in forests. As a result, placing a high degree of emphasis on intrinsic values might lead to reductions in certain economic benefits, including forest products and at least some types of forest-based recreation.

Social: Intrinsic values, like utilitarian values, reflect society’s desire to receive benefits from forests. As a result, consideration of the full range of forest values will improve decision-making. Given the wide range of value placed by individuals on aspects of forests that might be termed “intrinsic”, dialogues about these values are likely to remain contentious.

Comment—Developing Options

Additional 9. Issue: **Intrinsic value of land.**

Please check one:

- ☐ I am interested in this trend/issue and wish to provide comments (*Please go to options below.*)
- ☐ I am NOT interested in this trend/issue and do not wish to respond (*Please go to next page.*)
- ☐ I am interested in this trend/issue BUT I can not comment because (*Please check one.*)
- ☐ Too complex ☐ I need more information ☐ Other _____

Options

Please circle one response for each option.

- A. Conduct a forum on intrinsic values in an effort to promote understanding and dialogue about these values. This could facilitate more effective communication among stakeholders engaged in processes designed to make decisions about management of forests.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- B. Ensure that intrinsic values are overtly assessed in decision-making processes about forests.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

- C. Status quo: address intrinsic values on a case-by-case basis as they are raised by stakeholders.

1
Favor

2
Neither favor
nor oppose

3
Oppose

4
I don't understand,
need more information

Suggest changes to existing option(s) or recommend another option(s) and/or general comments about the trend/issue, implications and/or options.

Additional 10. Trend/Issue: Role of Forests in Protecting Water Quality.

Trend/Issue Definition

Forests are vital to the protection of water quality. This fact is obvious when you look at the resources of Wisconsin. The water resources in the northern half of Wisconsin, which is heavily forested, generally are of good to outstanding quality. In the southern half of Wisconsin, which is not as heavily forested, the water resources are much more likely to be degraded and in need of restoration.

The eighteen counties that make up DNR's Northern Region contain 72% of Wisconsin's lakes, 43% of our wetlands, and 37% of our stream miles. The Northern Region is also heavily forested, as it contains 51% of Wisconsin's forestland. The Northern Region has the best overall water quality in the state.

Implications

Ecological: Forested land soaks up all of the rain that falls on it and this water supplies streamflow and recharges the groundwater supply, in addition to providing for tree growth. Since forested land generates virtually no runoff, it is very desirable land use in terms of protecting water quality and reducing nonpoint source pollution. Nonpoint source pollution occurs when water from rain or snow flows overland and picks up particles of soil, sand or debris. All of these become pollutants when they are deposited into surface water. Nonpoint source pollution is the largest threat to water quality in Wisconsin, and the two biggest contributors are agricultural and urban sources.

Sediment (soil or sand) in streams, lakes, and wetlands is the most common form of nonpoint source pollution. As sediment builds up in stream channels, it restricts flow and may also redirect the flow of water, causing stream bank erosion. When too much sediment enters streams or lakes, it is harmful to fish as it buries their spawning beds, reduces what they can see (water becomes cloudy), and can even damage their gills. In addition, nutrients such as nitrogen and phosphorus that are attached to the sediment acts as fertilizer for undesirable aquatic vegetation, like algae. Algae create more problems for fish because the decomposition of algae consumes oxygen from the water, which fish and other aquatic species need to live.

Economic: The economic implications associated with water quality are enormous. What kind of price do you put on having clean water to drink? What is it worth to you to have clean lakes and streams that you can swim and fish in? It is very expensive and slow to clean up lakes and streams that have been impacted by nonpoint source pollution. It is much more affordable to keep water clean in the first place. The best way to keep surface water clean is by maintaining healthy forests on the land. Money invested in planting trees or improving forestland goes a lot farther than money invested to clean up water. The forest industry is also very important to Wisconsin's economy, accounting for 6% of the Gross State Product.

Social: There are important social implication involved with this issue. As noted above, society needs to have clean water to drink and for recreational uses, like fishing and swimming. Forests are also very important for hiking, hunting, skiing, snowmobiling, etc.

Comment—Developing Options

Additional 10. Trend/Issue: **Role of Forests in Protecting Water Quality.**

Please check one:

- ☐ I am interested in this trend/issue and wish to provide comments (*Please go to options below.*)
- ☐ I am NOT interested in this trend/issue and do not wish to respond (*Please go to next page.*)
- ☐ I am interested in this trend/issue BUT I can not comment because (*Please check one.*)
- ☐ Too complex ☐ I need more information ☐ Other _____

Options

Please circle one response for each option.

- A. No action alternative. Monitor forestland management activities in watersheds.
- | | | | |
|-------|-----------------------------|--------|--|
| 1 | 2 | 3 | 4 |
| Favor | Neither favor
nor oppose | Oppose | I don't understand,
need more information |
- B. Demonstrate appropriate management techniques on state forestlands and encourage other private and public landowners to conduct similar management on their lands.
- | | | | |
|-------|-----------------------------|--------|--|
| 1 | 2 | 3 | 4 |
| Favor | Neither favor
nor oppose | Oppose | I don't understand,
need more information |
- C. Provide assistance and incentives for landowners to convert their non-forested land to forests and invest in beneficial management practices for water quality, such as forested buffer strips along riparian areas.
- | | | | |
|-------|-----------------------------|--------|--|
| 1 | 2 | 3 | 4 |
| Favor | Neither favor
nor oppose | Oppose | I don't understand,
need more information |

Suggest changes to existing option(s) or recommend another option(s) and/or general comments about the trend/issue, implications and/or options.

Additional Comments

→ *Go to next page*

Personal Background (Optional)

The information below will help us interpret the results of the feedback we receive.

- A. Are you male or female?

Please check one.

☐ Male ☐ Female

- B. How old are you?

Please fill in blank.

I am _____ years old.

- C. In what county is your primary residence?

Please fill in blank.

- D. Do you own forestland in Wisconsin ?

Please check one.

☐ Yes ☐ No → *If no, go to Question F*

- E. How many acres of forestland do you own?

Please check one.

☐ More than 40 acres ☐ 40 acres or less

- F. Of which groups are you a member?

Please check all that apply.

- ☐ Interested Citizen
☐ Private landowner
☐ Forest industry
☐ Environment organization
☐ User group (for example lake association, atv group)
☐ Government (county and local, state, federal)

Thank-you for participating in this stage of developing a statewide forest plan.

Just drop this in the mail using the self-addressed stamped label. (Tape can be used to seal the pages.)
To receive the results of this round of feedback, please provide us with your name and mailing address below.
If you would like to receive the results electronically please provide your email address.

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Organization/Company _____

Street or PO Box _____

City _____ *State* _____ *ZIP* _____

I would like to receive the results of this survey via email. ☐ Yes ☐ No

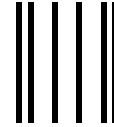
Email address _____

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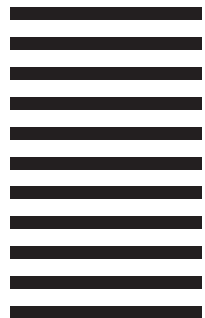
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